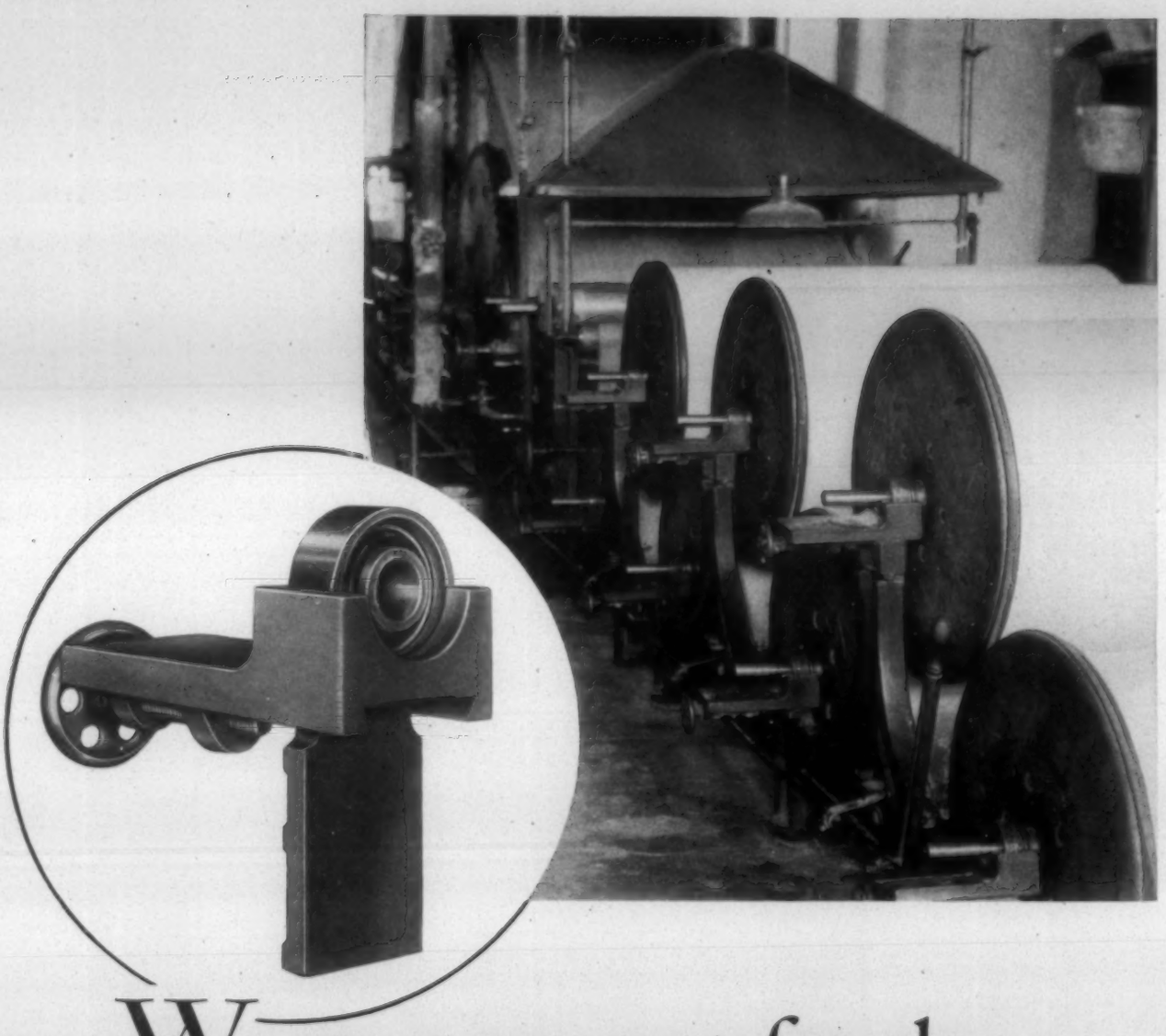
TEXTILE BULLETIN

VOL. 60 JULY 15, 1941 NO. 10



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THIS IS NO. 28 OF A SERIES ON

GETTING THE MOST FROM WINDING

Information about winding designed to show improvements in winding equipment and new ideas in the winding operation

NEW TRAVERSE BAR LEVER WITH REPLACEABLE LOCKING POINT (No. 90 Winder)

In order to increase the life of the No. 90 Traverse Bar Lever and also to save the mill the trouble of periodically replacing the complete lever, a new design has been developed.

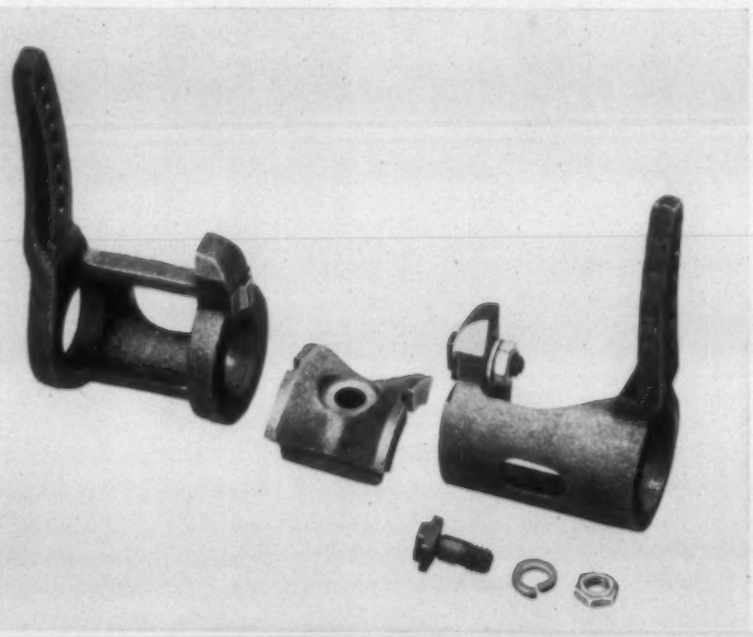
The Lever Lock now has a hardened steel point which, in many cases, has more than doubled the period between replacements. Since this new Locking Point is *replaceable*, it is no longer necessary to remove the rocker shaft from the winder when making a replacement.

It will be necessary to install a new Lever (90-62-16x) in order to get the advantage of the replaceable Locking Point. Once the new Lever is installed, the Locking Point can be quickly replaced at small cost and without interfering with production.

This Locking Point is made with a 15° angle in order to provide a more positive drive at high speeds. When Lever 90-62-16x takes the place of 90-62-12, the Drivers need not be changed.

An older style Lever 90-62 is made with a 25° angle. When it is replaced with the new Lever, it will also be necessary to install Driver 90-63-5 in order to have the same 15° angle on both the Locking Point and the slot in the Driver.

When making the change in one machine, 20 Levers and 10 Drivers are required. Old parts removed from the machine can be used for replacement on other winders in the room.



Left — old-style Traverse Bar Lever 90-62-12. Center — Driver 90-63-5. Right — new Traverse Bar Lever 90-62-16x with replaceable Locking Point, also shown in foreground.

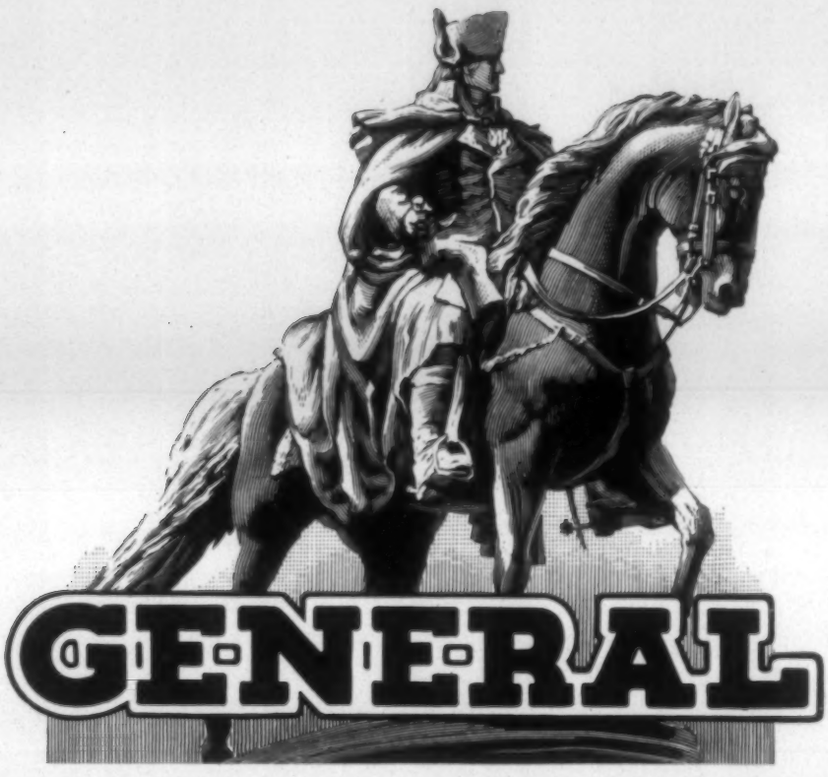
WINDING 2 ENDS AT ONCE ONTO FILLING BOBBIN (No. 90 Winder)

Some mills have attempted to wind two ends of yarn from two supply packages onto a single loom bobbin, using individual tension control for each end.

This has been found to be generally unsatisfactory, due to the different diameters at which the yarn goes into the bobbin. When taking the yarn off the bobbin, one end will always be tighter than the other, and a loop will form in the slack end.

It is recommended that the two ends of yarn be wound into cones or tubes on the doubler. From such packages, the yarn can be taken through a single tension on the No. 90 winder.

If a slight amount of twist in the two ends is not objectionable, the yarn can be delivered over the end of cones. If no twist is desired, tubes can be wound for an unrolling supply.



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HOW CROWN TENASCO HIGH-STRENGTH RAYON YARN HELPS SHOES HOLD THEIR SHAPE LONGER*

You might not expect to find an idea in an old shoe. But that's exactly where the idea originated for Rosenstein's new extra-strong elastic shoe lining. Here's how it happened...

One of the fabric experts of this company questioned his wife about a pair of shoes which she had tossed in the trash basket. "They're not worn out," she admitted, "but they're so badly out of shape I can't wear them any more." That set him to thinking. He found that many women's shoes were discarded for the same reason. "If I could only develop a strong, elastic fabric for shoe linings," he thought, "the problem would be solved."

Many types of fabric were tried out, with mixed success. Then along came Crown Tenasco, the new high-strength rayon yarn. It was just what he needed. It had the extra strength to withstand the "sawing" action that goes on within a shoe-lining fabric as the shoe is worn. It wore longer and resisted the effects of moisture. Its added durability held shoes in shape longer.

Today this fabric, "Rosine," with Crown Tenasco warp and elastic fill, is an established favorite with many leading shoe manufacturers. Yardages have exceeded all expectations. All because a man found an idea in an old shoe and then put that idea to work with Crown Tenasco.

Perhaps *you* have a fabric idea tucked away somewhere, unused, for want of a stronger rayon yarn. Or perhaps extra strength may be just what you need to improve one of your present fabrics, to lift it out of the competitive class. Whichever is the case, it will pay you to get the facts on high-strength Crown Tenasco. Write today for complete information.

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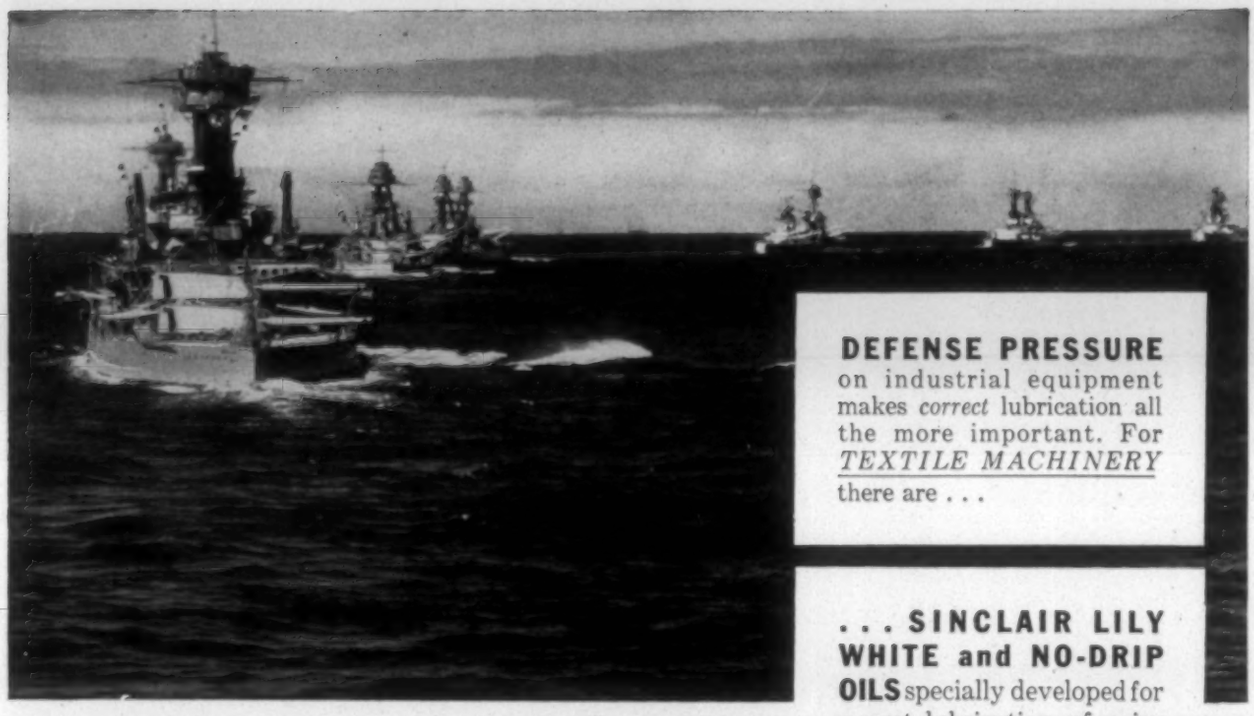

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TEXTILE BULLETIN

Vol. 60 July 15, 1941 No. 10

Promoting the Domestic Consumption of Cotton*

By Claudius T. Murchison, President

The Cotton-Textile Institute, Inc.

FOR a long time cotton has been the most important fiber in the world. In a recent study, the Department of Agriculture estimated that during the years 1933-37 cotton represented 56 per cent of the world's total fiber consumption. Yet until very recently cotton has strangely enough been almost wholly neglected as an object of scientific laboratory research. Such research as was directed toward cotton was in the main confined to the mechanics of cotton processing, with but little thought given to the physical and chemical properties and possibilities of the fiber itself.

The explanation is not far to seek. Within its range of accepted use cotton has but little competition. Growers, spinners, and fabricators found a ready market for their products at satisfactory prices. If there was concern over cotton, it was with the problem of providing more and more acreage and more and more output. But this triumphant march of cotton was lately brought to at least a temporary halt.

Synthetic Fibers Evolved

Enterprising men saw the possibility of profits in providing the world with new and varied fabrics, and turned to new sources of production. They employed freely the intellectual power and facilities of science in their struggle to derive these novel fibers and fabrics from trees, coal tar, and other substances. Although the first efforts were pathetically disappointing, they coupled persistence with their resourcefulness, and, in the course of time, developed synthetic fibers and materials which won high acceptance from the general public and threatened seriously many forms of cotton utilization.

These developments assumed spectacular proportions by the end of the 1920's and are still moving forward with cumulative speed, revealing new miracles of scientific discovery with each passing year.

Thus threatened with ultimate destruction, cotton has awakened to the importance of using as defensive devices the methods so successfully followed by its gigantic young competitors. But as yet cotton has scarcely passed this period of awakening. There are many hundreds of cotton manufacturing units in the United States, but of these probably not more than a dozen are actively and persistently engaged in laboratory research efforts designed to broaden the usefulness or improve the processing or increase the utility of the products which are created from cotton.

There are likewise in the United States scores of educational institutions with well-equipped laboratories and ably-staffed scientific departments. But of these probably not more than a dozen are engaged in comprehensive and continuous research on cotton.

For some years the United States Department of Agriculture, through its Bureau of Plant Industry and its Agricultural Marketing Service, and with some measure of co-operation from the various State governments, has engaged in basic cotton research, but these researches have of necessity been confined largely to the agricultural aspects of cotton and are only beginning to reach the point where the findings can be made useful in actual mill operations.

A general review of all cotton research activities engaged in throughout the country indicates that they have been for the most part unrelated, lacking in continuity and comprehensiveness, without the benefit of definite purpose or guidance, and without that close and intimate connection with industry itself which would assure maximum utilization of the findings of the laboratory. But, despite this discouraging exhibit, it can truthfully be said that all cotton interests, agricultural and industrial, have finally become research-minded and are prepared, mentally and financially, to provide the support for scientific research which has so long been lacking. Certainly the practical results are already visible.

Merger of Research Activities

The recent merger of the research activities of the Textile Foundation and the United States Institute for Textile Research indicates a greater desire for co-ordination of effort and an appreciation of how these efforts can best be promoted. The sponsorship of the Cotton Research Foundation by the National Cotton Council is

*Address before the Cotton Research Congress at Waco, Tex., June 28, 1941.

further evidence of the growing collective interest in cotton research.

The latest example of this interest is the establishment by the Cotton-Textile Institute of a Division of Cotton Research. This undertaking differs from the others referred to in that its chief function will be to co-ordinate, and in every way possible bring to successful fruition the researches of all agencies concerned with cotton.

It will first centralize all available information concerning research in progress in all laboratories. This information will be classified by laboratories and by projects. Its next duty will be to analyze and appraise the objectives and potentialities of each project and make available to the cotton manufacturers such practical findings as may be useful to them. In the course of time, it will endeavor to formulate new products and exercise such general guidance as may be suggested by the combined knowledge and experience of the manufacturers and the research specialists.

It will maintain close liaison with all of the technological associations within the industry or related to it. It is presumed also that it will work in close co-operation with the Textile Foundation and the Institute for Textile Research and the Cotton Research Foundation, and all other research bodies which have an active interest in cotton. It will also serve as a medium for closer relationship between the industry and the research agencies of the Government.

In order that the breadth of its scope may have no restriction, its work will be regarded as a part of a joint cotton program of the Cotton-Textile Institute and the National Cotton Council. This arrangement provides the means of assuring speedy application in industry of the research findings of the laboratories. As they emerge from the world of the test tube and abstract theory, we shall immediately put behind them all of the industry's promotion power in order that they may quickly become a part of the world of industry and of consumer enjoyment.

As the fruits of scientific exploration find their way into industrial application, we may expect continually increasing financial support and a still greater harnessing of science to the opportunities of cotton. The theoretical range of research activity in cotton is limitless. We may take as an arbitrary starting point the individual cotton fiber. It is by no means standardized. It will vary from its billions of fellows in length, in diameter, in wall thickness, in tensile strength, in surface smoothness and in many other respects. As the physical properties of the fibers vary, so varies the spinning quality of the cotton and the character of the fabric which is ultimately produced.

But we do not yet know fully all of the relationships of fiber properties to spinning quality. We must not only know these, but we also must know how to control them. It is not enough merely to know the spinning qualities of a particular variety of cotton. We must also know the spinning qualities which can be derived from the blending of varieties.

But the problem is much bigger even than this. The physical properties of the fiber are also conditioned by soil, climate, by methods of cultivation, by the time of harvesting and methods of ginning, and many other variable factors. As the answers are found to the questions here suggested, these answers will be of inestimable value to mills and farmers alike. To the farmer they will give guidance in the selection of seed, soil, cultivation and ginning procedure. To the mills they will give the corollary or supplementary guidance in the selection of cotton for spinning purposes, in the blending of fibers, and in the machinery and methods of processing. As they serve better the interest of both groups, they make for a better product with less wastage and lower costs. These in their turn directly lead to a greater volume of consumption because they provide to the consumer more utility at lower prices.

Given that stage of development, and I hope it is not far distant, when desired spinning and weaving results can be predetermined in terms of cotton fibers, and when the farmer in his turn can dependably supply cotton of desired physical properties in just the right quantities, cotton will have overcome a major disadvantage relative to synthetic fibers. The attainment of this stage is an opportunity for great achievement.

Chemical Treatment of Fibers

A second field of great possibilities has to do with the chemical treatment of yarns or fabrics, not primarily for the purpose of obtaining a desired finish, but more particularly to obtain a desired utility of a practical nature, such as greater tensile strength, water repellancy, increased resistance, mildew resistance.

A third great field of opportunity for research has to do with the finishing of fabrics primarily for the purpose of greater consumer enjoyment as distinct from practical utility. Here are concentrated all the problems having to do with color. New and attractive shades are always necessary as a market stimulus. This involves research not only in the creation and blending of dyestuffs, but also in the methods of their application. There is involved here the all-important and extremely vexing question of color fastness. The field embraces stock-dyed, yarn-dyed, fabric-dyed, and printed materials.

Here the arts become a potential ally of science and so is created a wholly new type of research.

But the finishiug of fabrics involves many more questions than those pertaining to color. Fabrics of essentially the same weave pattern may be given a multitude of surface effects to charm every individual whim of a multitude of consumers. These many variations of finish in color, design, feel, body, drapiness, crispness, ad infinitum, may not demand a high rating from a strictly utilitarian point of view. Yet their function in stimulating an ever active market for cotton goods is invaluable, and continued progress in their development must be assured if our objective is to increase the consumption of cotton.

Another type of research about which much has been said but comparatively little done is the adaptation of cotton to new uses. This type of research does not usually have its beginnings in the laboratory. Potential new uses must be discovered by methodical exploration of the world about us.

Such explorations have already been made with good results in the fields of highway and building construction. Because of them we are now witnessing a rapid growth

(*Continued from Page 8*)

The Spinning Quality of Texas Cotton*

By Malcolm E. Campbell

Senior Cotton Technologist

ACCORDING to statements published over a long period of time in many technical books and treatises bearing on cotton, Texas cotton is "A clean, light brownish lint, with hard-bodied character, and suitable for warp yarn up to 50s count." Although that definition does not fit Texas cotton as we know it today, it is difficult, or rather impossible, to know even the degree to which this definition actually described the cotton grown in Texas 40 or 50 or more years ago, since adequate data from controlled laboratory tests are either lacking or extremely scanty. It does seem likely, though, that the largest proportion of the cotton grown in Texas up until the early years of this century was of the so-called "Texas Big Boll" type. So, to this extent, the published description may have been fairly accurate in certain respects although it certainly would appear that the successful spinning of an acceptable yarn "up to 50s count" was an extremely optimistic claim of attainment for any cotton of 15/16 or 1-inch staple.

"Texas Cotton" Not a Type

The term "Texas cotton" may be sufficient to distinguish this lint from such radically different growths of cotton as sea-island, Egyptian, or Chinese, but it certainly is not specific and precise enough to describe a type of American upland cotton. In the last 30 years or so, many varieties of cotton have been introduced and grown in Texas, and it is estimated by agronomists and others that several hundred so-called varieties (or variety names used to describe the cottons) have been grown here. And, on a basis of our more recent spinning and fiber data, the importance of variety, or inheritance, as a factor in determining the spinning and fiber quality of a cotton is more evident now than ever before.

Thus, it is clear that a range of quality exists in the cotton grown in Texas today. This is borne out forcefully by the Department's statistics concerning the staple lengths in the Texas crop, as compiled by the Agricultural Marketing Service. In 1939, for example, a substantial proportion of the crop produced in Texas was below 7/8-inch in staple, and the lengths found ranged up to 1-1/16 inches and even longer. Staple length is, however, only one of many elements of quality involved in cotton. That is to say, although there are no official standards for cotton character, our spinning results unmistakably reveal that the character or "spinning utility" of Texas cotton available today also covers a wide range.

What do foreign and domestic spinners think of Texas cotton? At the moment, no doubt, European spinners would be willing to pay almost any price for almost any kind of cotton, but what did they think of Texas cotton when they were last able to get it? Few facts and figures are available to answer this question precisely. On the one hand, however, we know that more than one-half of the American exports in recent years have been comprised of Texas cotton and that over 90 per cent of the cotton grown in Texas has been exported. On the other, we know of the criticisms that European spinners have voiced against American cotton. For example, the International Cotton Congress, meeting in Rome in 1935, adopted the following resolution: "The Congress directs the attention of the United States Government to the gradually deteriorating quality of American cotton, which is undoubtedly one of the reasons for the diminishing consumption of such cotton."

The resolution goes on to say: "In recent years the Governments of other cotton-growing countries (meaning countries other than the United States) have concentrated upon and succeeded in improving the quality of their crops to the advantage of both growers and spinners alike, and this Congress is of the opinion that the quality of the American cotton crop demands the most urgent and immediate attention on the part of the United States of America if they wish to maintain their position in the markets of the world."

Although this resolution was phrased so as to apply to American cotton in general, it probably referred to Texas cotton in particular, in view of the large proportion of the cotton exported to Europe by this State.

That something is being done about American cotton in general and Texas cotton in particular will be demonstrated in a few moments. Before we go into that matter, let us consider, first, the other half of the question; that is, what do American spinners think of Texas cotton? Under present world conditions and outlook, such reactions are of great importance to Texas growers; in fact, greater than ever before.

Southeastern Mills Use Southeastern Cotton

Statistics collected by the Department through its Agricultural Marketing Service do not give a direct answer to this question. They do show, though, that for the 1938-39 season cotton spinners in the Southeastern States purchased only about 10 per cent of their American cotton from the Southwestern States. This entire 10 per cent was not, of course, all Texas cotton. Nearly half of the cotton consumed by Southeastern mills that year

*Address, Second Cotton Research Congress, Waco, Tex., June 26th-28th.

came from the Southeast itself, most of the rest being of the longer stapled Delta types. The chief reason for their apparent preference for Southeastern cotton in the shorter lengths is undoubtedly the extra cost of transporting the Western cotton to the mills. Thus, it may be concluded that the mills of the Southeast do not think enough more of Texas cotton to pay half a cent a pound more for it, which is about what the difference in transportation or freight charges for the two regions would be. As to the mills in the non-cotton producing States, chiefly in the New England section, about one-third of the American cotton that they consumed came from the Southeast area from which it could be landed at these mills about as cheaply as could Southeastern cotton.

From these facts it appears that, from the standpoint of the mills in this country, the choice between Texas cotton and other American growths of comparable staple length has been determined chiefly by price which, in turn, has been influenced by transportation charges to a degree that affects the choice.

Although staple length is only a partial indication of quality, it may be of interest to see what, if anything, has happened to the average length of the Texas crop in relation to that of the entire crop. For the 11-year period ending with the last crop, there has been a definite upward trend in the staple length of the American crop, including Texas, amounting to an average of about 1/16-inch. During this period, there was a definite decrease for about eight years in the average length of Texas cotton, followed by an increase. Last year the Texas crop averaged about 1/64-inch longer than it was in 1929, and about 1/16-inch shorter than the average for the American crop.

The increase in the average staple length of the crop is undoubtedly due in a large measure to the Cotton Improvement program inaugurated a few years ago. This program was given considerable impetus three years ago when Congress passed the Smith-Doxey Act, providing for free cotton classing for organized groups. The cotton producers of Texas and other States have shown an increasing interest in this service, and last year 1,525,000 samples were classed under the provisions of this Act for 1,573 organized groups throughout the country.

One-Variety Communities

In Texas during the last six years, the Cotton Improvement program has grown about 18-fold in number of communities participating, and about 22-fold in the acreage planted in cotton. In 1940, there were 573 one-variety communities in Texas, involving about 1¾ million bales. About 21 per cent of the Texas cotton acreage in 1940 was included in the one-variety community program, as compared with about 19 per cent for the country as a whole. This is all well and good, of course, provided that the varieties selected by these groups have desirable spinning quality, coupled with high yield and lint turn-out. The spinning and fiber tests conducted by the co-operative laboratories of the Department are, it is believed, furnishing valuable information on the subject of quality.

In co-operation with the Texas Agricultural and Engineering Experiment Stations, the Department maintains at College Station a completely equipped laboratory for testing the quality of cotton. A similar laboratory is located in South Carolina, in co-operation with the Clemson Agricultural College. Each of these laboratories contains complete equipment for manufacturing and testing yarn and cord under the most precise and accurately controlled conditions. In addition, each laboratory is equipped to make measurements of cotton fiber length, strength, fineness, and immaturity. In the Department's laboratories in Washington, other apparatus is used for making color, chemical, and X-ray analyses.

Naturally, all of these tests take time to make, and trained technologists to conduct the work. At the College Station laboratory there is a staff of 11 technical and clerical workers, and this group can make complete spinning and fiber tests at an average rate of slightly better than one sample of cotton a day. This may appear to be a very slow rate to one who is not familiar with the work. But, when it is remembered that in a spinning test alone, a sample of cotton passes through from 9 to 18 different manufacturing processes, and that large numbers of weighings and other tests have to be made at frequent intervals, it will be recognized that considerable time and effort are necessary for this work if dependable data are to be obtained.

In the four and one-half years that the laboratory has been in operation, more than 260 samples of cotton grown in Texas have been tested. Much of the effort at the laboratory has been exerted on the country-wide regional variety studies, of which the Texas Agricultural Experiment Station and its workers have taken an active part. Now that this laboratory work of the three-year regional variety series across the cotton belt has been completed, however, it is expected that even more laboratory attention will be given to Texas cottons in the future than has been possible during the past.

For purposes of this discussion it will not be necessary to go into the details of the regional variety studies for the cotton belt as a whole. It will be sufficient only to point out that complete spinning and fiber tests have been made on 768 samples of cotton, representing two replicates of each of 16 varieties grown at eight locations over the cotton belt for three successive crop years. This is the most comprehensive study that has been conducted to date to furnish information on the influence of variety, location, and climate on the quality of cotton.

Two of the eight locations included in these tests are in Texas—College Station and Lubbock. The relative standing of these two stations will be of interest, therefore, in a consideration of the spinning quality of Texas cotton. On an average, the cottons grown at the two Texas stations were somewhat shorter in staple than those from the other stations. But the ranking of the Texas cottons with respect to the strength of the yarns spun from them was higher than might have been supposed from this fact. For example, the College Station cottons, when averaged together, ranked sixth, sixth, and eighth in staple length for the 1935, '36, and '37 crops, respectively. The yarn strengths for the same cottons, however, ranked second, fifth, and first for those same years. This would suggest that the College Station samples were of better-than-average character. Reference to the results of fiber tensile strength tests shows that this

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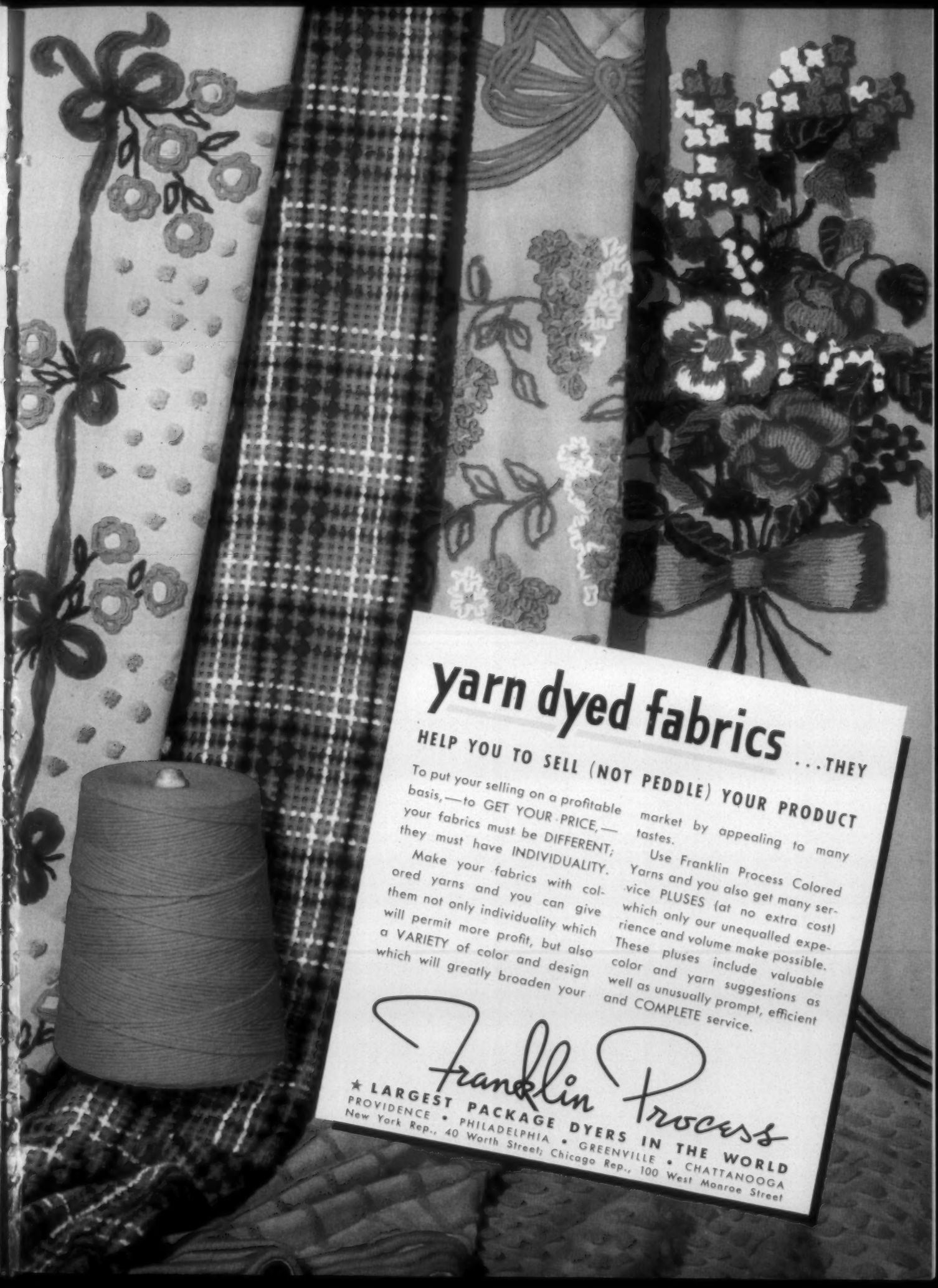
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Combination Yarn Defects*

By C. W. Bendigo

BEFORE proceeding with "Combination Yarn Defects and How the Throwster Can Prevent Them," we should agree on what combination yarns are; especially to distinguish them from ply and novelty yarns. Ply yarns are composed of two or more similar threads placed parallel to each other and twisted together. Novelty yarns can be either similar or dissimilar threads combined, but are characterized by nubs, loops, spirals, or other contours. Combination yarns are the union of dissimilar threads the most common in throwing being one strand of normal or low twisted acetate combined with an end of hard-twisted viscose crepe. Other combination yarns the throwster encounters are made from one end spun rayon and one end viscose crepe, or from spun rayon and acetate, cotton and rayon, wool and silk, and even plying of two ends of combination threads.

To avoid confusing the many different combination yarns let us understand that unless the construction is specifically mentioned we will mean one end of acetate containing around three turns (a few more or a little less) combined with one end of viscose crepe having 45 or more turns per inch and with all twists being in the same direction. Most of the combination yarn thrown is of this construction. The defects and principles concerning it will apply to the other combinations mentioned. We would not have time this evening to cover all the defects in all combinations which reminds me of an incident that happened several years ago.

A weaver on combination fabrics was about to be discharged for having excessive seconds. He used the classic alibi of "bad throwing" to which he was reminded that his cloth was not graded seconds because of yarn defects, but almost entirely because of light and heavy marks due to bad starts. He unhesitatingly came back, "If the blank-blank yarn wasn't so bad I wouldn't have had to make the start-ups." The throwster can't win.

What happened to the weaver was that he was let go, the deciding factor being that he had developed a "yarn complex." I hope that none are developed as the result of this paper, for even though the list of combination yarn defects is great there is much that the throwster can do and is doing to prevent them.

The preponderance of combination yarn defects are those of damaged yarn, principally broken filaments, and those of bad plying such as loops and kinks, all of which often result in skin-backs. Other defects are slubs or twisted-in waste, wrong twist, stretched yarn, mixed yarn, and even knots and dirt. In addition to these, combination yarns are subject to all the imperfections found in each of the single threads such as slubs, cut yarn, fly waste, wrong denier, wrong twist, tramage, and any mixtures. Trouble also arises from use of tint in one thread which is not fugitive from the other with which it is plied. Covering the whole field of combination yarn defects would include, as can be seen, crepe throwing as well as combination throwing and also raw yarns. Reference will be made to crepe yarn problems especially since so much crepe used in combination is made in the same plant. However, I prefer to think of combination throwing as being as distinct from crepe throwing as crepe is from silk. I believe that the matter of throwing will be greatly clarified if it is thought of as being divided into four parts: silk, crepe combination, and novelty. At the conclusion of this paper it will be interesting to know how many persons will agree and how many disagree with my feeling that combination yarns are closer to the novelty yarns than crepes, so far as throwing is concerned.

All throwsters running combinations with whom I have talked have more defects and surely more trouble, year in and year out, from bad plying than from anything else. Second on the list is broken filaments. Weavers see most bad plying as strip-backs, which are also known as skin-backs, caterpillars, and by other various terms. Some bad plying they see in its clearer forms of loops, kinks, and spirals. Loops generally refer to excess acetate in relation to the crepe. Kinks and spirals usually mean too much crepe in relation to the acetate. In order to determine what the throwster can do to prevent these defects we should first know what causes them.

The primary problem is that when combining and twisting, the crepe end contracts differently from the acetate. Loops, kinks, and spirals are caused either by failing to correct sufficiently the feeding of each of the two ends in combination or by overcorrecting. This problem of correcting the feeding is most difficult since practically all rayon combinations are run on doubler-twisters with single speed feed rolls such as Fletcher Duplex, Atwood 5-B and the U. S. doubler-twister. The problem is further complicated by the general practice of running the combination yarns in two operations. In the second operation, which is up-twisting, no control whatever can be made on the single ends since the yarn is already plied yet the uneven contraction between the two ends continues with each turn inserted.

The problem becomes clearer when a particular yarn is considered. Let us use 150 denier 3 turns "S" acetate plied 7 turns with 150 denier 48 turns crepe all twists being "S." This is the popular 150/150 yarn. Of course, we all know that the so-called 150 denier crepe is not 150

*Paper presented at meeting of American Association of Technical Technologists.

deniers but rather about 178 deniers, but the 150 denier 3 turns acetate is very close to 150 deniers. We unquestionably have unlike yarns to be combined. One is viscose crepe at 178 deniers, the other is acetate at 150 deniers. The two are to be put together with only 7 turns, but bear in mind that as these turns are inserted in the ply 7 turns also go into each of the individual threads. A few years ago a great many persons I talked with still believed that turns in the ply did not affect the turns in the individual strands, but lately I am glad to say, everyone seems to agree on this point.

Now, 7 turns added to the 48 turns in the crepe causes considerable contraction, the full amount depending upon the tension under which the yarn is twisted. But 7 turns added to the 3 in the acetate causes relatively little contraction. The result is that when both ends are fed equally the crepe contracts to the point where the acetate forms loops upon it. To overcome this more tension is applied to the acetate than to the crepe on the doubler-twister so that the acetate either stretches (not elongates) slightly or else tension is applied to the extent that the acetate slips very slightly on the feed roll. Too much stretch and the result will be elongation or breakage. Too much slip, and the crepe kinks on or spirals around the acetate and is sure to cause acetate strip-backs since all the strain put on the yarn must be borne by the single acetate strand.

One is often asked, "What should be the relationship between the acetate and the crepe threads in a combination?" That sounds like, and is, a hard question, for no one can answer that the acetate should be such and such a per cent of the crepe, unless it is qualified minutely by such factors as deniers, filaments, turns, manufactures, soaking formulae, and all tensions. I feel that the only correct answer that can be given is that the relationship should be such that in the final thread each end will bear as much as possible of its share of the strain that will be exerted. There are exceptions to this rule in novelty yarns, but not in combinations as we know them today. A difficult angle to this rule is that one cannot tell whether the ply is correct except by testing the completed yarn. Bear in mind that generally the yarn has been put through two twisting processes and two steaming periods. This will be gone into more fully later. After the correct ultimate ply is determined standards can be set for each process but the yarn must constantly be checked and when any new lot of yarn started, double-checked.

We have mentioned 150/150 combination, which is one of the most difficult to throw. Let us now consider briefly one of the easiest, which is 100 denier "S" twist 52 turns viscose crepe combined 14 to 15 turns "S" with 150 denier "S" twist 3 turns acetate. In this crepe the actual denier is about 116, which is still well under the acetate denier. Here we find two factors off-setting rather than aggravating each other. The addition of turns to the crepe make it contract more than would a similar or lesser denier acetate, but counteracting this is an acetate of heavier denier which takes up almost as much as does the crepe. The result is generally a smooth thread with each component able to carry its share of any subsequent strain. For the best yarn only a slight tensioning of the acetate above that applied on the crepe is needed on this construction to prevent all loops, kinks, and spirals—provided, of course, that the yarn is run with normal tension of around 20 grams.

Tensioning is important to prevent acetate loops and even crepe kinks. Too little tension and the crepe component contracts even to the extent of forming snarls, meanwhile the acetate puckers up. Sometimes these defects straighten out when tension is applied in later operations, but this, too often, is accompanied by a damaging of the crepe at the places where it kinked resulting in the yarn being blamed for having weak places that cause strip-backs.

It is easy to imagine the trouble that can be caused by combination yarns which are overstretched due to excessive tension. Unless the throwster catches this stretching either when checking tensions or by observing broken filaments, he generally will not know about them until complaints come in of streaky warps or filling bands. Even then it is not always clear that excessive tension in throwing caused the streaks and bands. Defects from stretching are among the most insidious confronting the throwster. On the surface it seems that stretch should be relatively simple to keep under reasonable control, until it is recalled that practically all rayon combination yarns are run in two operations. By two operations, I refer to the practice of doubling the yarn on a ring twister while inserting a low number of turns, usually around three, at about 6,000 spindle speed. Then this yarn is brought up to full turns on a silk type up-twister. It so happens that in the first operation, which is ring twisting, the tension normally becomes less as the take-up bobbin becomes full. Thus the yarn run with the lightest tension is on the top of the doubler-twister bobbin. When this doubler-twister bobbin is placed on the up-twister for the second operation it starts off with a light tension which normally builds up as the yarn runs off. Thus the yarn which was subjected to the most tensioning in the first operation is also subjected to maximum tension in the second operation. And conversely the thread that had the lightest tension in ring twisting receives the lightest in the second time twisting. This is especially bad, for very often it causes loops at the start of the second time twisting or it may be seen occasionally as crepe kinks in the first operation. The more prevalent form of this defect is seen in the cloth as either long or as bunched loops of acetate. The reason for the long or bunched loops, is that the flyer wires used in the second time twisting slide back the acetate loops and finally they go through. This sliding of the acetate by the flyer wire can also cause strip-backs since the tip of the flyer wire frequently damages or even breaks the acetate loops after which they run through.

The seriousness and prevalence of this tension problem can be illustrated by the fact that every combination throwster I know of gives the yarn a slight steaming between the two operations. This tends to set the crepe twist and slightly elongates it and loops do not form. I cannot recommend the practice of many throwsters who apply additional steaming to yarn that has started to kink. I also cannot recommend—from a cost angle if no other—the practice of backwinding combination yarn between the two twisting operations.

The question naturally arises as to why combination yarns are thrown in two operations since it seems clear that more nearly perfect yarn could be made in one oper-

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Text of Ceiling Order on Grey Goods

FOLLOWING is the text of the order issued by the OPACS, and signed by Leon Henderson, price administrator, fixing the maximum price level for six leading types of cotton cloth. The order has caused a great deal of protest among textile men.

"The office of price administration and civilian supply is charged with the maintenance of price stability and the prevention of undue price rises and dislocations.

"Cotton grey goods are used as the basic fabric for finished cotton textiles. They are also used extensively in an unfinished state. Finished cotton textiles constitute a major portion of the material used in both military and civilian clothing. Furthermore, cotton grey goods, in both their finished and unfinished states, are indispensable to the manufacture of numerous other items used by both the armed forces and civilians.

"In the last 12 months the cotton grey goods market has advanced sharply. During that period there has been a 69 per cent increase in the average price of the principal constructions. This has meant a 106 per cent increase in the average mill margin for those types of cloth. This upward price movement has been out of all proportion to any increases in costs of materials and production. Largely responsible for this inflationary trend have been the fear of buyers that prices would continue to rise, and the activity of speculators and hoarders who have taken advantage of their fear and of the heavy demand for textiles arising from defense needs.

"It is apparent, therefore, that in order to insure stability of the price structure and to forestall widespread speculation, hoarding, and profiteering, the national defense and the public interest require that maximum prices be established for cotton grey goods.

"The maximum prices set forth below allow a mill margin substantially above the average which the industry had enjoyed during the past five years.

"On the basis of information secured by independent investigation by this office, and upon information furnished by the trade, I find that the maximum prices herein established are necessary and reasonable.

"Accordingly, pursuant to the authority vested in me by Executive Order No. 2734, and after consultation with the price administration committee, it is hereby directed that:

"1316.1 Definitions. (a) The term 'Cotton Grey Goods' as used herein, means cotton grey goods, in their unchanged mill state, of the types listed in Section 1316.7 hereof; it does not include any cotton grey goods which, in the performance of a recognized commercial service, have been either (i) further processed or (ii) cut and repacked.

"(2) The term 'person' includes an individual, corporation, association, partnership, or other business entity.*

(*1316.1 to 1316.8, inclusive, are issued pursuant to the authority contained in Executive Order No. 8734.)

"1316.2. Maximum prices established for Cotton Grey Goods.

"On and after June 30, 1941, regardless of any commitment theretofore entered into, no person shall sell or deliver, or offer to sell or deliver, any cotton grey goods, and no person shall buy or accept delivery of, or offer to buy or accept delivery of, any cotton grey goods at a price exceeding the maximum prices set forth in Section 13.16.7, except that:

"(1) Any person who prior to June 30, 1941, acquired Cotton Grey Goods at a price higher than the applicable maximum price set forth in Section 1316.7, and prior to that date entered into a firm commitment for the sale of such Cotton Grey Goods to any person, may, upon approval by the Office of Price Administration and Civilian Supply of an application filed on or before July 31, 1941, on Form No. 111:1 (copies of which may be obtained on request made to the Office of Price Administration and Civilian Supply, Washington, D. C.) be permitted to deliver and accept payment for Cotton Grey Goods at the price contract for, provided that such deliveries are completed on or before September 2, 1941:

"(2) The prices established herein are not applicable to sales or deliveries of Cotton Grey Goods to any person or persons outside the United States, its territories and possessions.

(b) The prices established by this schedule are f.o.b. to the seller's point of shipment. They are gross prices before discounts of any nature are deducted and they include all commissions.*

"1316.3 Records. Every person who, during any calendar month, shall sell 500 pounds or more of Cotton Grey Goods shall keep for inspection by the Office of Price Administration and Civilian Supply, and preserve for a period of not less than one year, a complete and accurate record of every sale of Cotton Grey Goods made during such month, the person to whom such sale was made, the date thereof, the price paid, and the quantity and specifications of the goods sold.*

"1316.4 Reports. On or before August 7, 1941, and on the 7th day of each calendar month thereafter, every person who, during the preceding calendar month, has made sales or deliveries, other than those described in Section 1316.2 (a) (2), of Cotton Grey Goods aggregating 500 pounds or more shall submit to the Office of Price Administration and Civilian Supply a report, on Report Form No. 111.2 (copies of which may be obtained upon request made to the Office of Price Administration and Civilian Supply, Washington, D. C.), in which he shall

(*Continued from Page 43*)

Normal Service Continues on Loom Repairs Shuttles and Bobbins

Loom Repair Parts And the Defense Program

The Textile Mills of this country are operating at the highest degree of activity in history, a large percentage of them on Defense Work. Three shifts are quite general and employment of much green help is necessary.

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Piedmont Section A.A.T.C.C. Enjoys Summer Outing

THE 1941 summer textile convention season in the South came to a grand and glorious end, June 27th-28th, with the annual outing of the Piedmont Section of the American Association of Textile Chemists and Colorists at Myrtle Beach, S. C., and the period between now and fall can be devoted to rest and recuperation, uninterrupted by nothing more arduous than routine duties.

Attendance totalled well over 350, including members' wives and guests, and apparently a good time was had by all. Headline events were the golf tournament at the Ocean Forest Country Club and the bridge tournament for the ladies at the Ocean Forest Hotel. No serious casualties were reported in either affair, despite keen competition.

Those who did not participate in these two events could choose their favorites from a sports menu of horse racing, fishing and surf bathing, with side dishes of impromptu entertainment.

The climax of the outing was the banquet Saturday night in the dining room of the Ocean Forest, at which a splendid floor show and the presentation of prizes were the features. A dance, scheduled for the patio following the banquet, had to be transferred to the dining room at the last moment, due to an unexpected downpour that occurred just at the moment when the orchestra was getting ready to warm up for the first Conga. However, in

(*Continued on Page 36*)

1. Pete Gilchrist, Chairman Golf Committee; Cy Goldberg, Tom Redmon, C. F. Martin.
2. H. B. Dohner, Ernie Kieswetter, Fred Duncan, Ed Steere.
3. Tom Larson, A. T. Lomax, C. E. Horne, Cliff Myers.
4. Evan F. Chambers, H. B. Constable, J. S. Gardner, A. W. Stafford.
5. H. O. Pierce, W. R. Steele, I. B. Covington.
6. Jack Jarrett, winner low gross; Erwin Laxton, Graham McNair, F. H. Ross.
7. H. C. Hatch, H. M. Sprock, W. G. Avery, J. S. Lange.
8. C. B. Harris, explains the situation.
9. Jack Button, Vice-Chairman, Golf Committee.
10. D. C. Newman and party.
11. P. E. Smith, Wyss Barker, Bob Howerton, Treasurer Piedmont Section; Chas. Griffin.
12, 13, 14. Fast Brown! Henry Gaede, Si Parker, Sam Hayes.
15. Mr. and Mrs. Ira L. Griffin and party.
16. Carrol Martin, C. O. Stephenson, N. A. Ruston, Toots Causey.

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S. C. Mill Men Discuss Carding, Spinning, Weaving

THE Spring Meeting of the South Carolina Division of the Southern Textile Association was held at the Drayton Mills Community House, Spartanburg, S. C., on Saturday, May 10, 1941, beginning at 10 o'clock. The Chairman, W. T. Morton, Overseer of Spinning at Monarch Mills, Union, S. C., presided.

The first part of the report of the discussion at this meeting was published in the June 15th and July 1st issues, covering the carding and spinning portion of the discussion. The report continues here, immediately following the introduction of J. H. Burgess, who led the weaving discussion.

J. H. Burgess, Overseer Weaving, Marion Mfg. Co., Marion, N. C.: I am glad to pinch hit for you this morning.

Judging from the number of questions, I notice that the weavers in this section are not having much trouble. (I am out of this Division now, I remind you.) There are only two questions under weaving, although one has several parts, whereas the carders had three and the spinners four.

Life of Shuttle On X Model Loom

The first question is: *"What should be the life of a shuttle on an X Model loom making 185-195 picks?"* That does not take into consideration the number of shifts or the number of hours run.

Frank D. Lockman: Let's put in on an hourly basis.

Mr. Burgess: All right. How many hours do your shuttle average? I am sure most of us keep a record on the life of shuttles?

Frank D. Lockman: How many weavers are here?

Mr. Burgess: The weavers here will please raise their hands. Five. Mr. Bishop, how many hours do your shuttles average?

O. E. Bishop, Overseer Weaving, Springs Cotton Mills, Gayle Plant, Chester: I would be ashamed to tell you. I have 138 X Model looms, running three shifts. I use 550 shuttles a month.

Mr. Burgess: Mr. Lockman, have you any X Models?

F. D. Lockman, Jr., Overseer Weaving, Monarch Mills, Lockhart: No, sir.

Mr. Burgess: Mr. Mace?

O. A. Mace, Overseer Weaving Eureka Plant, Springs Cotton Mills, Chester: I am sorry; I do not have a record.

Mr. E.: I have only a few X Model looms, but we use plenty of shuttles.

Mr. Bishop: Is that using the Stafford cutter?

Mr. Burgess: The question does not say, but I presume most of them use the Stafford cutter. My experience is that it does not last as long as with the old model feeler. The shuttle is a weaker shuttle; it has more slots in it, and it will burst up much sooner.

Also ,the number of filling you are making will determine the life of the shuttle—of course, with the speed.

F. D. Lockman, Jr.: Mr. Hammond keeps a good shuttle record.

Mr. Burgess: Mr. Hammond, let's hear from you.

Mr. Hammond: I should like to tell you that we have raised the life of our shuttles, on an average of about 90 hours a week, until on the last record we had a life of 11.92 months, which is almost double what it used to be. The consumption of shuttles can be brought down by proper methods. I thought seven and a half months was extra good, when we got that; but we have gone from ten months to 11.92, which is almost twelve months. Of course, the more threads you have the harder it is for the shuttle to pass through the yarn. That has an effect on the life of the shuttle. Since the builders have streamlined the binder, the shuttle leaves the binder perfectly straight, and that has eliminated a good deal of trouble.

Mr. Burgess: You redesigned your binder?

Mr. Hammond: Yes, sir. It is perfectly straight; there is no swelling at all. The shuttle comes out in a perfectly straight line, and it saves the shuttle.

Shown above is a drawing comparing the conventional binder with the one used by Mr. Hammond, which he was kind enough to send us. The swell in the conventional binder is exaggerated somewhat for effect.—Ed.

Mr. Burgess: I am sure we weavers have something to shoot at, to get our shuttles to last twelve months on an 85-hour week. That is practically a two-shift basis. We

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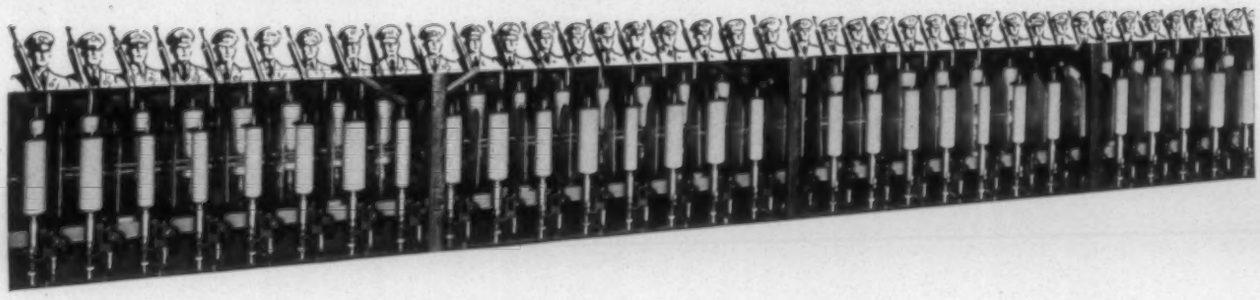

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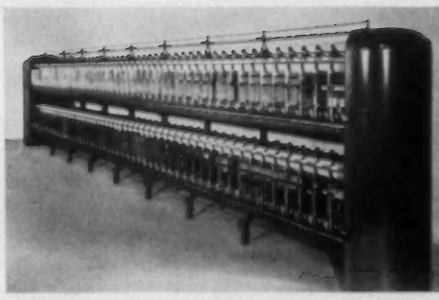

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used to pat ourselves on the back if we could get the shuttles to last a year on a 55-hour week. I shall have to find out how this streamlined binder is made. If Mr. Hammond is getting a year on 192 picks he has accomplished something.

Question: How does the number affect it?

Mr. Burgess: Take 40s filling—it runs much longer; you have fewer transfers at the loom. I find with a light shuttle or a small shuttle or a shuttle weakened by having to use the Stafford thread cutter, if the loom transfers every two minutes your consumption will be much more than if you run 40s filling, which runs twelve minutes. I do not know whether any of you fellows will agree with me on that. But with filling that runs two or three minutes there is a constant transfer. That shuttle boxes properly most of the time, but sometimes it does not and you have a burst shuttle.

Pickers

The next question is: *"Which is the better picker to use on an X Model loom, leather or rubber? State the life of each."*

Frank D. Lockman: We have no X Model looms, but I think the rubber picker is better for any loom. I think you get more life out of it and have fewer defects in weaving from it.

Mr. Burgess: Do you gentlemen who have X Model looms use the rubber picker?

A Member: We use rubber pickers on cotton.

Mr. Hammond: We have run them five years and find them very satisfactory.

Mr. Burgess: I understand why this gentleman over here would use a different picker on rayon.

Frank D. Lockman: I have had no experience on rayon or silk and should like to ask why the rubber picker would not be better on that.

Mr. Burgess: My experience has been rather limited, but I find that rayon will hang on anything the least bit rough—more so than cotton. Of course, the so-called composition picker will get fuzzy sometimes. Mr. Mace has used it. Will you tell us what your experience has been, Mr. Mace?

Mr. Mace: When we first began putting it in the loom fixers did not like it, because they have to do closer loom fixing. You have to box your shuttle perfectly in order to run the rubber picker, and that is why I like it. However, we do not run it on rayon.

Mr. Burgess: What is the life of the picker?

F. D. Lockman, Jr.: On an E Model loom, running 80 hours a week, the life of the rubber picker is seven months. The leather picker lasts five months.

B. Ellis Royal, Secretary, Southern Textile Association: Are there not different types of leather pickers, and would there not be a variation in the life of those different types?

Mr. Burgess: I think so. You can buy a cheap pair of shoes or a good pair of shoes, and the same is true with pickers. I think it pays to buy the best picker you can get, even if it is sometimes a little high.

Do you other weavers consider seven months a good average life for a rubber picker, on two shifts?

Mr. F.: I think that is pretty good. The speed has something to do with it.

Mr. Burgess: Yes, the speed has a lot to do with it. Then you have to box the shuttle right for a rubber picker.

F. D. Lockman, Jr.: He has to box it right to make it run right.

Mr. Burgess: That is my experience. You have to fix the loom a little closer.

Prevention of Broken Filling

Let's go on to the next question: *"What will prevent broken filling on X Model looms, No. 45 filling, 45" loom, speed 185 to 195?"* That is on cotton. I should like to know what will prevent it from breaking on a 40" loom.

Mr. G.: It is hard to tell that, isn't it?

Mr. Burgess: Yes, there is a question there. Sometimes we can pass the buck and say the filling is not made right. But assuming it is good filling—say it is A-1 filling, away above standard, with no thick or thin places in it, what would prevent it from breaking on an X Model loom making about 190 picks a minute?

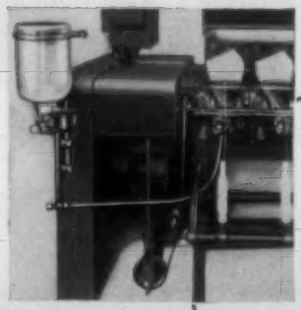
Mr. Mace: Are you speaking of filling breaking on the change, or just what?

Mr. Burgess: That is all we have in the question, Mr. Mace.

Frank D. Lockman: On any loom, X Model or E Model, whether running 160 picks or 200 picks, I will try to enumerate a few things that will cause filling to knock out before it runs empty on the quill. If the filling fork goes too far through the grate, we know that will cause the filling to knock out. If the filling fork does not go through at the right angle that will cause the filling to slide up on the fork and cause the loom to knock out. If the pickers are not perfectly adjusted, so as to push that shuttle out of the box, as Mr. Hammond says, streamlined, then you will have the shuttle rising up on one end and going down on the other end, and that will cause the filling to rub against the box and cause it to break. If the shuttle is not properly boxed and if the shuttle bounces in the box, bounces back, that will slack the filling and cause that shuttle to knockout. Then I have found some looms where the stick was not right, where the stick hit the bottom of the lay-in there was a quarter of an inch space there. You would find that more on a full bobbin than on a half-empty bobbin, because the shuttle is that much heavier and causes it to rebound.

Mr. H.: Assuming that all conditions are ideal, on a loom making 195 a minute, there are a lot of things involved in there. In speaking of breaking filling on high-speed looms, we overlooked the fact that the filling balloons out of the shuttle. I think that contributes to a large percentage of filling breakages after the loom has made a perfect transfer and before the time when the bobbin is exhausted. As these fellows here know, that comes from not properly furring the shuttle to hold the bobbin inside.

(*Continued on Page 36*)



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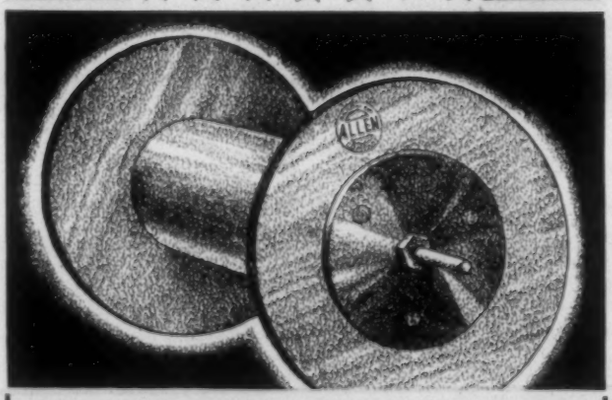

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Mill News

CAPE CHARLES, VA.—The Cape Charles Knitting Mills have been placed in bankruptcy and are not operating at present.

ANNISTON, ALA.—The recently established Elwar Hosiery Mills will operate 11 full fashioned machines.

ENGLEWOOD, TENN.—The Loretta Hosiery Mills have gone out of business and the plant has been dismantled.

VICTORIA, VA.—The Hanover Broad Silk Works, Inc., have gone out of business and the plant has been dismantled.

TERRA ALTA, VA.—The Terra Alta Hosiery Mills are now idle and the mill is for sale or rent. They have seven full fashioned machines.

BANNING, GA.—The newly organized Winton Mills, with H. B. Upchurch, manager, and J. M. Jordan, superintendent, are operating full time.

ELBERTFN, GA.—The Seaboard Silk Mills have been acquired by the United Rayon Mills of New York and are now operated as Elberton Mills, Inc. Norman G. Glatfelter is local manager.

NEWNAN, GA.—The Fuller Hosiery Mills have ceased operations but no announcement of their future plans has been made. They have 25 knitting machines which were operated upon anklets and work socks.

GASTONIA, N. C.—Robt. Goldberg has given up his lease of the Piedmont Mill, a 6,000-spindle yarn mill, and it is now being operated by its owners. Max Goldberg is president, Sam B. Goldberg is secretary and treasurer and M. H. Jackson is superintendent.

UNION, S. C.—The woolen mill to be established at this place will be known as the Excelsior Mills. It will have 2,160 wool spindles and 60 looms, all of which will be new equipment. Arthur Burnet will be manager.

GRANTVILLE, GA.—Grantville Mills have awarded a contract to Hardin & Ramsey, Atlanta contractors, for construction of a new warehouse and opener room, to cost $27,885. Robert & Co., architects-engineers, prepared the plans.

BURLINGTON, N. C.—The newly organized concern, Coplan Fabrics, Inc., is scheduled to get into full operations by the first of the year. This new industry was organized by J. R. Copland and local associates. It is a $200,000 diversified industry which will employ approximately 200 operatives.

SPARTANBURG, S. C.—Operation of the Beaumont Mfg. Co. to fill government orders for duck needed by the United States Army will begin as soon as the mill can be rehabilitated.

Walter S. Montgomery, president, said that since a large portion of the machinery is obsolete and the mill is located within the city limits, "it had been necessary to give serious consideration to liquidating the company."

Announcing new plans for the mill, he explained that the manufacture of duck called for the extensive modernization program.

HALIFAX, N. C.—The Halifax County Board of Commissioners has tentatively approved a request for $5,000 to erect a textile building and shop room for training purposes at the Roanoke Rapids High School.

LANETT, ALA.—The new office building of the Lanett Mill Division of the West Point Mfg .Co., representing an investment of approximately $20,000, was completed last week, occupancy taking place Monday. The building was designed by Kennon Perry, architect, and constructed by the Batson-Cook Co.

The structure is modern throughout and splendidly adapted to the needs of the company. On the first floor are the offices of Superintendent R. W. Jennings, Assistant Superintendent R. J. Jennings, the general office, and the office of Mr. Jennings' secretary.

On the second floor are the laboratory, vault, storage rooms, an emergency hospital and waiting room, the office of the personnel director, and the cost-production office.

Personal News

Bass Redd is now superintendent of Jefferson Mills No. 3, Royston, Ga.

Wm. F. Fahrback and Js. H. Carrigan are operating the Crewe (Va.) Hosiery Mills as partners.

R. F. Passal is now office manager of the Central Falls (N. C.) Mfg. Co.

F. S. Tolar is now superintendent of the Central Falls (N. C.) Mfg. Co.

J. E. Mansfield is now superintendent of the Pickett Hosiery Mills, Burlington, N. C.

Leonard Pach is superintendent of the South Silk Mills, Spring City, Va.

J. C. Holt has been transferred from Banning, Ga., to superintendent of the Winton Mills, Fort Valley, Ga.

Maurice McQuinn, formerly with A. D. Julliard & Co., Aragon, Ga., is now superintendent of Lucy Mills, Marietta, Ga.

Lewis N. Peeler, formerly of Gastonia, N. C., is now second hand in spinning room at the Irene Cotton Mills, Taylorsville, N. C.

John Strater, formerly with Patterson Mills, Roanoke Rapids, N. C., is now overseer of spinning and winding at Perfection Mills, Weldon, N. C.

T. O. Wynn, formerly of Thomaston, Ga., is now first shift overseer of carding and spinning at the Granite Falls Mfg. Co., Granite Falls, N. C.

C. E. Clark has been made superintendent of the Riverside Division of the Riverside & Dan River Cotton Mills, Danville, Va.

W. P. Hamrick, technical advisor of the Columbia (S. C.) plants of the Pacific Mills, and general superintendent of this group of mills until he was retired from active duty by the textile company recently, has been re-elected president of the Columbia Chamber of Commerce.

E. M. Henning has succeeded the late C. W. Gaddy as manager of the knitting department of the Wiscassett Mills, Albemarle, N. C.

Norman G. Glattfelter is now local manager of the Elberton Mills, Ins., formerly the Seaboard Silk Mills, Elberton, Ga.

W. W. Sharp, Jr., general manager of the Siler City (N. C.) Hosiery Mills, has assumed the office of president of the Siler City Rotary Club.

W. F. Wyatt, president of the Wyatt Knitting Co., Sanford, N. C., has been elected a director of the Rotary Club of Sanford.

J. E. Stone has been promoted to superintendent of the Aragon-Baldwin Mills, Rock Hill, S. C. He was formerly assistant superintendent.

W. Frank Lowell, Jr., of Biddeford, Me., son of the sales manager of the Saco-Lowell Shops, will enter the Textile School of N. C. State College in September.

R. S. Scarboro has been made superintendent of carding and spinning at the Dan River plant of the Riverside & Dan River Cotton Mils, Danville, Va.

Jas. B. Cannon, son of M. L. Cannon, of Charlotte, president of the Carolina Textile Corp., Dillon, S. C., is to be married to Miss Colgate, of Flushing, N. Y.

John W. Murray, textile editor of the *New York Journal of Commerce* since 1935, is to become head of the public relations department of the Cotton-Textile Institute.

R. Z. Cates, president of Arkwright Cotton Mills, Spartanburg, S. C., was painfully but not seriously injured recently when jumping a horse at the Spartanburg County Fairgrounds.

S. W. Nicholson, director of vocational education at Spartanburg, S. C., senior high school, has been named head of the Drayton Mills' employment and service department, Spartanburg.

Fred Nash has resigned his position with the sporting goods department of Montgomery & Crawford, Spartanburg, S. C., to take charge of the new recreation center at the Riverdale Mills, Enoree, S. C.

Robert Moore, of the Dacotah Cotton Mill, Lexington, N. C., who is a reserve officer, has been called into active service with the U. S. Army. He will be stationed at the air base at Baton Rouge, La.

A. G. Myers, president of Textiles, Inc., who has been recuperating at Virginia Beach following an operation a number of months ago, is expected back at his desk soon.

J. F. Whorton, formerly overseer of twisting at Brookside Mills, Knoxville, Tenn., is now night overseer of spinning, twisting and winding at Virginia Mills, Swepsonville, N. C.

Reserve Officer Joseph V. Moffitt, Jr., son of J. V. Moffitt, secretary and treasurer of the Wennonah Cotton Mills, Lexington, N. C., has been called into active duty with the U. S. Army.

W. H. Conner has resigned his position with the Gastonia Combed Yarn Mills to accept a position as general overseer of spinning, twisting and winding at the Virginia Mills, Inc., Swepsonville, N. C.

Fred K. Owen has resigned his position as night overseer at the Armstrong Mills, Gastonia, N. C., to accept a position as day second hand in spinning at Virginia Mills, Swepsonville, N. C.

W. H. Kiser, formerly with the Gastonia, N. C., plants of the Burlington Mills Corp., and before that with Watts Mills, Laurens, S. C., has been appointed superintendent of the Drayton Mills, Spartanburg, S. C., succeeding Smith Crow, resigned.

William C. Friday, a recent graduate of the North Carolina State College Textile School, has accepted a position with the Du Pont Co., at Waynesboro, Va. Mr. Friday is the son of D. L. Friday, secretary of the Cocker Machine & Foundry Co., of Gastonia, N. C.

W. P. Crawley has resigned his position as instructor in weaving and designing at the Textile School of North Carolina State College, Raleigh, N. C., to accept a position as textile engineer with the Tennessee Eastman Corp. at Kingsport, Tenn.

Agnew Hunter Bahnson, Jr., vice-president of the Bahnson Co., Winston-Salem, N. C., manufacturers of humidifiers and air conditioning systems, was recently married to Miss Katharine Reynolds King, of Leaksville, N. C.

In the July 1st issue, it was announced that Wade Hearne had been appointed superintendent of Edna Mills Corp., Reidsville, N. C. This was an error. Mr. Hearne was promoted from the position of loom fixer to assistant to the superintendent.

Employees of Leaksville Mill Vote Against Union

Leaksville, N. C.—Employees of the Leaksville Woolen Mill, one of the oldest mills in continuous operation in the South, have voted against unionization.

Although the Textile Workers Union won an election at the mill in October, 1938, the mill went on slack time shortly thereafter, and a contract was never negotiated. Since then the union has been the bargaining agency in the mill for union members only.

Ebert Butterworth Enters Army Service

Col. J. Ebert Butterworth, vice-president and treasurer of H. W. Butterworth & Sons Co., entered U. S. Army service on June 24th as director of recreation at Camp Ritchie, Md. He has been granted a one-year leave of absence from the company.

Colonel Butterworth has been treasurer of the Butterworth organization since 1919. With J. Hill Zahn, he opened the Butterworth Southern office in 1923 and represented the company in the South from 1923-30. Since 1930, he has been in the office in Philadelphia.

Colonel Butterworth was named Captain of Infantry on August 8, 1917, on completion of his course at the First Officers Training Camp at Fort Niagara, N. Y. He was assigned to the command of Company F, 313th Infantry at Camp Meade, Md., and in July, 1918, took his company to France. He served with both the 316th and 313th Infantry Regiments, commanding first a company and then a battalion in action. He was wounded at Montfaucon.

He was discharged at Camp Dix in June, 1919. In July, 1920, he accepted a commission as Captain of Infantry in the U. S. Army Reserves. In 1922 he was assigned to the 316th Infantry with rank of Major. Later in the same year, he was promoted to the grade of Lieutenant Colonel. On June 14, 1932, he was promoted to the grade of Colonel and was assigned to command of 1301st Service Unit.

New Finishing Machine Firm Formed

Lynchburg, Va.—Precision Finishing Machine Corp., headed by Philip Hickson, has opened a plant here, both to produce equipment and decorate fabrics by the silk screen method.

The firm will turn out high-speed machines which will replace the hand stenciling of fabrics and paper, according to Mr. Hickson.

For the present, the company will specialize in decorating acetates, nylon, oil silk papers, leather, glider cloth and certain cotton materials.

Majority of Textile Graduates in Service

Dean Thomas Nelson, of the N. C. State College Textile School, says that 25 of the 48 young men who graduated from the Textile School of State College in June had accepted commissions in the Officers Reserve Corps, and that practically all of them are now in the service.

Because of their special training a large percentage of them have been assigned to the Quartermaster Corps and ordered to the Quartermaster Depot at Philadelphia.

Riverdale Mills Will Open Modern Recreation Center

A most modern recreation center is to be put into operation at Riverdale Mills at Enoree, S. C.

The center will consist of modern bowling alleys, ping-pong tables, basketball courts, skating rink, gymnasium and motion picture show and a nine-hole golf course.

Fred Nash, who for the past several years has been connected with the sporting goods department of Mont-

gomery & Crawford, Inc., Spartanburg, has been named director of the athletics for the Riverdale Mills, officials of the textile plant announced.

Draper Corp. Marks 125th Year

Hopedale, Mass.—The Draper Corp. celebrated its 125th year in the loom manufacturing business during the past month. The company's current *Cotton Chats* marks the event with a series of photographs illustrating the following high-points of textile machinery during this century and one-quarter.

In 1816, the original "Self-Moving" temple, invented by Dra Draper, enabling one weaver to run two looms instead of one.

In 1846, W. W. Dutcher Patent First Parallel Underpick shuttle motion.

In 1857, Snell and Bartlett let-off.

In 1859, Stearns Parallel made by George Draper & Son.

In 1863, Frog with loose steel invented by George Draper. First made as an attachment for Mason looms and later used on every loom built in this country.

In 1868, Metcalf Patent on the first practical self-threading shuttle.

In 1869, Carroll double flange ring.

In 1878, The Rabbeth Spindle.

In 1895, "A" Model Northrop Loom, the first automatic bobbin changing loom in the world.

In 1941, the Model S-X-2 Draper Loom.

Textile Men Among Members of Georgia Defense Commission

Atlanta, Ga.—The State Commission recently named by Governor Eugene Talmadge to act in an advisory capacity on the location of National Defense industries in Georgia includes some names of some well known in the textile trade. Among these are: Cason J. Callaway, of Hamilton, of the Callaway Mills; Norman J. Elsas, Atlanta, Fulton Bag & Cotton Mills; William J. Vereen, Moultrie, president of the Southern Garment Manufacturers' Association, and Don Towers, Anchor Duck Mills, Rome, Ga.

Nylon Production At Martinsville, Va.

Martinsville, Va.—E. I. du Pont de Nemours & Co., from its Wilmington, Del., office has issued an official statement denying rumors current in Martinsville and in Virginia manufacturing circles that September 25th has been set as the opening date for the new nylon plant near Martinsville.

The company's statement is as follows:

"Regarding the report that the Martinsville plant will start production September 25th, no date for the beginning of production has been definitely set. The company hopes production can be started during the fall. Somewhat prior to the start of production some people who will be employed in the textile area will be instructed in their duties, using yarn that has been made in the Seaford, Del., plant, but this will not be production. We will advise when production at Martinsville will start as soon as a date has been determined."

Five-Month Profit of Pacific Mills Put At $1,016,580

Boston, Mass.—Henry M. Bliss, president of Pacific Mills, making his treasurer's report to the special meeting of stockholders, reported an estimated profit of $1,016,580 for the five months ended May 31, 1941. Estimated operating profit for this period was $2,050,400, with $283,820 reserved for taxes and $750,000 set aside as a reserve fund for contingencies such as losses incurred in the liquidation of properties.

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Contributions on subjects pertaining to cotton, its manufacture and distribution, are requested. Contributed articles do not necessarily reflect the opinion of the publishers. Items pertaining to new mills, extensions, etc., are solicited.

Inteference With Natural Laws

Leon Henderson and his OPACS set out to disrupt the natural laws of supply and demand but are not finding it as easy as they expected.

W. Ray Bell, president of the Association of Cotton Textile Merchants of New York, well states the situation when he says:

"Always up to this time the industry has operated on a contract basis. The great majority of sales have been made for delivery one to six months in the future. Prices established by such contracts in turn have regulated operating policies at the mills. Thus the principle of sanctity of contracts has had the strongest practical as well as ethical foundation in the cotton-textile industry.

"The OPACS price ceiling order of June 27th seeks to invalidate prices in existing contracts if they are above the fixed price ceilings. If this order is valid, no contract at any price can mean anything, for if OPACS can fix a 39-cent price ceiling today, it can fix a 37-cent or 35-cent price ceiling tomorrow just as easily and with just as little advance notice.

"Thus the grey goods market is now a spot market, and will doubtless remain a spot market as long as the OPACS order stands. And since the mills are largely sold out for the next several months, there is little or no spot merchandise to be traded in the grey goods market.

"This is the real reason for the present paralysis of the grey goods market, unparallelled in the annals of the cotton-textile industry. Nothing could be further from the truth than to refer to it as a 'sellers' strike,' for there has been no concerted action by the mills or by their agents on Worth Street. On the contrary, the present situation is a natural result of the character of the OPACS order and the uncertainty and confusion that inevitably have followed in its wake.

"It is a complete misrepresentation of the motives of the cotton-textile industry to say that its members are opposed to the principle of controlling prices to prevent a runaway inflation. Representatives of the industry have repeatedly asserted their desire to co-operate with OPACS in any sound, workable plan of price control.

"On the other hand, at no time have Mr. Henderson or other OPACS officials called upon qualified representatives of the industry to participate in the determination of price ceilings. Had OPACS taken advantage of the industry's desire to co-operate by giving qualified representatives of the industry a voice in its counsels, the inequities and inconsistencies of its price ceiling order would almost certainly have been avoided, and there need have been no interruption of the normal operation of the grey goods market."

Leon Henderson Predicts

In times, such as now face us, it is well worth while to examine both viewpoints and we therefore quote from an address of Federal Price Administrator Leon Henderson before the New York Houseware Manufacturers' Association.

Mr. Henderson said in part:

"It becomes my disagreeable duty to tell you that the party is over. . . . Before long now, there will be more purchasing power running around hunting something to buy than there are goods available. . . .

"I wish I could tell you that we had an easy solution, that everything is going to be all right. I can't promise you any such hope. All I can tell you is that only by sweating blood and tears can the dislocations be held to a minimum.

"No exactly similar paradox ever confronted American business. Customers eager and able to buy will be crowding the market places and stores, but manufacturers will be unable to get enough raw materials to satisfy demands. . . .

"Thus, it is a dark picture I paint. It is a picture of factories made idle by lack of raw materials to turn out civilian goods, of men made idle by lack of materials to work with, of single industry towns blighted by spurious prosperity based on production of goods which we can't wear, or eat, or live in.

"No power on earth can prevent inflation unless the Government succeeds in controlling prices, purchasing power and installment buying. It must stiffen control of

prices no matter how ornery and belligerent the outcries become.

"Prices are going up—'it's only a question of time lag when they will hit the pocketbook'—and taxes will later rise to act as a further brake on purchasing power to prevent inflation.

"If we are in earnest about this matter—and I believe deep down we all are—then the American way would be to out-produce Hitler. We can do this if we spend three hours out of every eight-hour working day for defense."

Small Acreage

The Government places the cotton acreage at 23,519,000 and the heavy and almost continual rains in the east, do not indicate a high yield per acre.

If the yield should be that of last year, 255.5 lint pounds per acre, the crop would be 11,666,000 bales. If the yield is 198.1 pounds, which is the ten-year average, the crop would be 9,153,000 bales.

Between 1915 and 1930 the yields ran from 132.5 to 192.5 and in those days a yield of 198.1 would have been considered quite an achievement, but with reduced acreage has come selection, intense cultivation and high fertilization, and a yield of 255.5 pounds was finally reached.

In spite of the small acreage and the indicated reduced yield, there should be plenty of cotton. A consumption of 11,000,000 bales and an export of 2,000,000 should not result in scarcity unless the Government holds too tightly to Government controlled cotton.

"Red" Professor Given Prison Sentence

We note the following:

New York, July 11.—Morris U. Schappes, 34, a native of Russia, a former Communist and suspended tutor at the college of the City of New York, was sentenced Friday to one year and six months to two years in prison for perjury before the Rapp-Coudert Legislative Committee investigating subversive activities in city schools.

There are several at the University of North Carolina, who could with equal justice be given the same treatment but those who sympathize with them, offer as defense a cry of "freedom of speech."

Using class rooms to instill subversive doctrines into the minds of immature young men is not using freedom of speech but license. Men who were paid to teach English or business administration have been among the greatest offenders.

The people of New York believe in freedom of speech but have refused to allow teachers of subversive doctrines to use same as a shield.

Send Them Some Boll Weevils

If Germany is to acquire the Ukraine section of Russia with its cotton and wheat, we think that it would be a good idea to send the Russians a good supply of boll weevils with the suggestion that aeroplanes drop them over the ripening cotton. From reports, we judge that North Carolina has a very ample supply of boll weevils and we volunteer to help pick them if the Russians will attend to the distribution.

We do not know much about wheat diseases, but have heard the "wheat rust" plays havoc, and if Germany acquires the Ukraine they should be supplied with some rust.

Take Time

Take time to look—it's the price of success;

Take time to think—it's the source of power;

Take time to play—the secret of perennial youth;

Take time to read—the source of wisdom;

Take time to be friendly—it's the way to happiness;

Take time to laugh—it's the music of the soul.

—N. C. L. News and Views.

C. W. Johnston

The death of C. W. Johnston marked the passing of one who for many years had been an outstanding figure in the textile industry of the South.

Mr. Johnston began life as a poor boy upon a farm in Cabarrus County, North Carolina, not far from where J. W. Cannon began his career, and had many characteristics in common with him.

We have never regarded either J. W. Cannon or C. W. Johnston as great manufacturers. Both were primarily merchants and gifted with unusual judgment and rare salesmanship and both had business ability, energy and capacity for work.

C. W. Johnston's opportunity came when he was called from Cornelius, N. C., to take charge of the almost defunct Highland Park Mfg. Co., which had only looms at that time, and had its warehouse filled with goods.

The salesmanship which he displayed in disposing of those goods and in finding a product which the company could manufacture and sell, launched him upon a career which entitled him to be named as one of the outstanding mill men of the South.

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DYEING AND FINISHING

Processing Spun Rayon Piece Goods

Part III

By C. R. Stockton

THE dyer and finisher of heavily pigmented acetate piece goods during the past six to eighteen months has found it increasing difficult to obtain a complete range of pastel to medium shades that will pass the 40 Fadeometer hour exposure test without "breaking." A list of acetate colors given in Part II* of this series show the reduced light fastness rating of these colors when used on lustrous and heavily pigmented acetate fabrics. This is a problem that should be solved by the makers of acetate yarns and not thrown into the lap of the rayon dyers and finishers, as the yarn makers are responsible for increasing the pigmentation of acetate yarns to a point where they affect the fastness properties of acetate colors t othe greatest degree probably ever caused by a change in yarn manufacture.

The rayon dyers and finishers must keep operating notwithstanding the innovations in rayon yarns given them to finish by the rayon weaving plants. There have been many suggestions on how to remedy this trouble caused by the greatly reduced light fastness on dyed pigmented acetate goods; some of these that may possess some possible value are:

(1) Replacing the present types of pigmenting or delustering agents with products that deluster the yarn but do not affect the fastness properties of the acetate colors so noticeably. Resins have been suggested.

(2) Weavers use lustrous or semi-pigmented acetate yarns, these fabrics to be dyed up with selected fast-to-light acetate colors, then the finishing plants run the dyed goods through special finishing assistants that will give a dull delustered affect to the finished goods. Such an operation would require exacting chemical and mechanical control during finishing. A delustering finish to be successfully applied must be first substantive to the acetate fiber, second, show no capillary or creeping action during drying, and third, permanent and be applied and finished at ordinary drying temperature of 220-260° F. If a delustering agent does not meet these requirements and be free from affecting dyed shades then it would not prove of interest.

(3) Pre-treating lustrous acetate fabrics with a substantive and permanent delusterant, drying, curing, and then dyeing with selected fast-to-light acetate colors. This last suggestion has been tried out with a fair degree of success on a laboratory basis but when carried through on a plant scale the delustrant gives a "smeary" effect on the finished goods. The "smeary" or streaked appearance of finished goods is caused by the capillary action or "creeping" of the delusterant during the drying and curing operations.

These are suggested procedures that may become realities in the near distant future.

There are many angles as to the action of the pigmentation and pigmented rayon fibers on the actual dyeing operation both for viscose and acetate fibers. These may be classed under:

(a) Retardant effect on colors.

(b) Physical and chemical effect.

(c) Effect on fastness properties of dyed fabric.

Retardant Effect On Colors

It is chiefly on the faster to washing and light direct dyeing acetate and viscose rayon colors that there is a distinct difference noted in the color values obtained on lustrous and pigmented yarns and fabrics processed under identical dyeing conditions.

The cheaper direct viscose colors are quite soluble and posses very rapid exhaust rates or affinity for viscose rayon fibers so do not show a noticeable decrease in shade value when dyed on pigmented viscose fibers at high temperatures. At low temperatures these cheaper direct colors show poor leveling and penetrating action on pigmented viscose. These cheaper directs may be padded on pigmented viscose goods at high temperatures in light shades but give poor color yield on pigmented goods in heavy shades at low temperatures.

The cheaper acetate colors due to their rapid exhaust show practically the same color value when dyed at higher temperatures but give very poor leveling and penetration at low temperatures. Due to the distinct difference between the dyeing action of acetate and viscose colors, the padding of acetate colors has not been carried out with any degree of success.

The most soluble of all direct viscose rayon colors are the diazo and developed types. These colors can be padded on pigmented viscose rayon goods (both spun and fila-

*Processing Spun Rayon Piece Goods—Pigmented Rayon Fibers—Part II—May 15, 1941—Textile Bulletin.

ment yarns) and the color value obtained are approximately similar, but this factor changes completely on the fast-to-light and formaldehyde aftertreatable direct colors. These direct colors possess good solubility but are all slow exhausting colors, so only a few are satisfactory for padding and then are usable only on lustrous filament viscose rayons and seldom on pigmented viscose spun and filament yarns. Many of these direct colors require a boiling dyebath and two or three times the dyeing period to secure equal color value when dyed on pigmented viscose as compared to lustrous.

The following group of direct colors illustrates the retardant effect of pigmentation on viscose rayon.

List of direct colors showing comparative dyeing time required to obtain equal color value:

Color	Dyeing Time	Amount of Color Used
Pontamine Fast Yellow NN	Requires double dyeing period	Equal
Pontamine Fast Yellow 4GL	Requires 2 to 3 times dyeing period	15 to 30% extra color
Pontamine Fast Blue 4GL	Requires 2 to 4 times dyeing period	20-70% extra color
Pontamine Developed Green 3G	Requires 1½ dyeing period	Equal amount
Formanil Red R	Requires 1½ dyeing period	Equal amount
Solephenyl Green BL	Requires 3 times dyeing period	25-50% extra color
Amanil Developed Blue BR	Approximately equal dyeing period	Equal amount
Pontamine Developed Scarlet 2BL	2 times dyeing period	25% extra amount
Formanil Navy G	Requires 1½ times period	Equal amount
Polyform Orange RF	2-3 times dyeing period	20-40% extra amount
Amanil Developed Violet BRD	Requires equal dyeing period	Equal amount

The fast-to-light direct dyeing acetate colors are very slow exhausting even on lustrous acetates and require high temperatures and two to four times dyeing period to obtain equal depth of shade when dyed on pigmented goods.

Physical and Chemical Effect On Colors

To obtain similar range of shades on the pigmented rayons as run on lustrous rayons, it has been necessary to find means and methods to change physically the pigmented acetate and viscose fibers temporarily during the wet processing and dyeing operations. Dyers have used various methods to bring this about. On the heavyweight viscose goods thorough prescouring of the goods will sometimes give the desired effect but it is usually necessary to add a small amount of soda ash or tri-sodium phosphate to the dyebath to keep the fibers swollen uniformly for level dyeing and penetration. The use of alkalies in dyebaths will increase the solubility of direct colors and slow the exhaust rate.

For lighter weight viscose fabrics, the use of a causticizing bath helps swell and equalize the fibers so that the dyeing operation may then be carried out in a neutral bath. The use of alkaline agents swell the pigmented viscose fibers and on medium to heavy fabric this action is of temporary nature but on the lighter weight print goods this physical action on fiber is of a permanent nature, as it is to "equalize" the fabric and give it a uniform dyed and finished effect.

Pigmented acetates can only be given a temporary physical change during the scouring and dyeing operations, otherwise the use of swelling agents may affect the fiber to such a degree that it will not dye satisfactorily or retain its desirable appearance when finished. To swell pigmented acetate fibers, it must be done slowly or the fibers and fabric may be swollen unevenly and if alkaline agents are used there may be partial saponification.

For jigg dyeing it is desirable to give two to four ends at 150-160° F. with 1 to 2 grams sulfated alcohol paste per liter with 0.1 to 0.2 grams sodium pyro phosphate per liter. Flush this bath off and give a half-bottom bleach.

For the bleaching bath, use grams per liter.

0.75 grams to 1.5 grams—Hydrogen peroxide—100 volume.

0.1 grams to 0.2 grams—Sodium silicate.

0.25 grams to 0.5 grams—Sulfated alcohol paste.

Run 2 to 6 ends, according to weight of goods. The heavier goods should be run at least six ends.

Pigmented acetate goods properly prepared as described seldom require any swelling agents in the dyebath on the jigg. Similar treatment may be given pigmented acetates to be dyed on dye becks either on dye beck or in the boil-off and crepeing bath.

If a swelling agent is used in dyebath, it has been found that 0.1 to 0.3 grams per liter of sodium pyro phosphate and equal amount of sulfated alcohol paste will give a good level with excellent penetration if carried out at 180° F. to 200° F. When dyeings are run at lower temperatures on pigmented acetates, they seldom show thorough penetration as the acetate color lays on the surface of the fabric since the fibers are not swollen sufficiently by the low dyeing temperatures.

Effect On Fastness Properties of Dyed Fabrics

The pigmentation agents affect the viscose rayon dyestuffs only slightly on light fastness and no effect is noticed on wash fastness as compared to the lustrous viscose. This is true only when the pigmented viscose fabrics have been dyed at a near boil, otherwise the dyestuffs will not penetrate or level satisfactorily. On some of the less soluble direct colors there is a tendency for the heavier dyed shades to crock, but this trouble is overcome by using the aftertreatable (formaldehyde) direct colors, as the hot aftertreating operation helps to remove this excess dyestuff clinging to outside of viscose fibers.

In addition to reducing the light fastness of acetate colors, the pigmentation agents appear to prevent the acetate fiber from being well penetrated, thus the excess acetate dyestuff remains on the surface. This causes crocking of the medium to heavy dyed shades and can be only corrected by returning the pigmented acetates to a dyeback, and dyeing near a boil for two to four hours with sufficient sulfated alcohol paste and a swelling agent such as sodium pyro phosphate. If the dyed acetate shade is not thoroughly penetrated, the wash fastness is lowered noticeably. This has been found true especially on the acetate yellows, oranges, and violets.

There is no aftertreating agent that can be used on acetate colors similar to formaldehyde that is used on direct viscose colors to improve wash fastness but if acetate colors are thoroughly penetrated and level dyed on pigmented goods they will possess almost equal wash fastness as on lustrous acetates. This is due to the very

good wash fastness of practically all acetate colors.

The finishing of pigmented viscose goods with urea formaldehyde resin usually steps up the wash fastness and reduces the light fastness on some of the fast-to-light colors while on less expensive direct colors the light fastness usually remains the same with a noticeable improvement on wash fastness.

The use of resins on acetates either lustrous or pigmented has not proven of any value as to improving wash or light fastness, but this phase of finishing acetates is being given intensive investigation by many plants and resin manufacturers. In the future some valuable agents may be offered to the trade.

Catonic agents have been used with some degree of success on the heavier pigmented acetates but on most fabrics they give too soft and raggy a hand and the tendency at present is to finish with a full crisp hand. To obtain this type of hand and feel on acetates requires the use of various finishing gums, starches, and other agents that destroy the substantive action of catons and for this reason they do not possess any softening action in these finishing mixes of this nature.

Borne Scrymser Plant Addition

Ground has been broken and construction is already under way on the new two-story brick and steel office building to be erected as an addition to the Elizabeth, N. J., plant of Borne Scrymser Co. The building will have a frontage of approximately 50 feet and a depth of 100 and will be situated in the center of the Front street side of the plant site.

Upon completion of this new unit, which is anticipated by early fall, the executives, clerical force, and the sales department will be moved from their present New York City location to the new building.

While some resulting economies of operation are expected, the company feels the greater benefits will accrue as a result of the improved and more compact facilities of the administrative, producing and selling departments.

Since 1874 Borne Scrymser Co. have manufactured high grade lubricating oils and greases, and chemical specialties for the textile, tanning, ink, cosmetic and other trades.

National Meeting A. A. T. C. C. To Be Held At Pinehurst

The national meeting of the American Association of Textile Chemists and Colorists will be held at Pinehurst, N. C., October 31st through November 1st. Headquarters will be at the Carolina Hotel.

A. R. Thompson, Jr., chairman of the publicity committee, announces the following program has been arranged and committees appointed:

Program

Friday Morning, Oct. 31—Registration.

Friday Afternoon, Oct. 31—Technical meetings.

Friday Night, Oct. 31—Entertainment.

Saturday Morning, Nov. 1—Technical meetings.

Saturday Afternoon, Nov. 1—Golf, tennis, skeet shooting, bingo, bridge, and sight-seeing trips.

Saturday Night, Nov. 1—Banquet.

Committees

General Committee: Samuel L. Hayes, Chairman, L. M. Boyd, D. Stewart Quern, T. W. Church, Jr., A. Henry Gaede, H. E. Kiefer, Jr., R. D. Howerton.

Publicity Committee: A. R. Thompson, Jr., Chairman.

Registration Committee: R. D. Howerton, Chairman.

Entertainment Committee: L. M. Boyd, Chairman.

Golf and Chemists Committee: J. D. Sandridge, Chairman.

Reservation Committee: D. Stewart Quern, Chairman.

Finance Committee: T. W. Church, Jr., Chairman.

Speakers Committee: Douglas C. Newman, Chairman.

Skeet Committee: Joe Moore, Chairman.

Reception and Information Committee: Robert A. Bruce, Chairman.

New A.A.T.C.C. Tests for Water Resistance Of Fabrics

The Committee on Water Resistance of Fabrics of the American Association of Textile Chemists and Colorists, with Dr. Harold W. Stigler, of the American Cyanamid Co., as chairman, has recently drawn up tentative procedures for (1) Hydrostatic Pressure Test, (2) Spray Test, and (3) Immersion Test. These three tests, which have been adopted as tentative by the A.A.T.C.C., are the outcome of considerable investigation and actual use.

The tremendous increase in the commercial importance of water repellent fabric has indicated the need for simple, reliable methods for evaluating their water resisting properties. Such fabrics possess three distinct properties which, therefore, require three separate tests for their evaluation. The proper use of the tests given here should yield sufficient information for a reasonably accurate evaluation of the water resisting properties of most fabrics.

The hydrostatic pressure test makes use of a new form of tester as compared to the type previously specified in the standard A.A.T.C.C. test. It is much smaller, easily moved about, readily constructed and offers better possibilities of controlling the temperature of the water.

The spray test is a simple and convenient method for rapid semi-quantitative control work. It measures the resistance to surface wetting under conditions simulating those of rain.

The immersion test is designed to measure the resistance of the fibers in a fabric to the absorption and retention of water.

The well known "Box Test" (hydrostatic pressure) has been dropped from the A.A.T.C.C. list of standard test methods, and the original "Hydrostatic Pressure Test" replaced by the new method described here.

Detailed description of the tests and apparatus will appear in the 1941 Year Book of the A.A.T.C.C., which will be published in the near future. Additional information may be obtained by corresponding with the General Secretary of the Association, Dr. H. C. Chapin, at the Lowell Textile Institute, Lowell, Mass.

Piedmont Section A.A.T.C.C. Enjoys Summer Outing

(*Continued from Page 18*)

view of the intense heat and humidity inside, it is doubtful if the dancers would have been more thoroughly drenched if they had remained on the patio.

First prize in the golf tournament, which was under the direction of Peter Gilchrist and Jack Button, went to Jack Jarrett, who had a 76 low gross. George Murphy was second with an 80. Other winners were Bill Kline, Tom Marlow, P. G. Hendrix, Howard Sprock, G. S. McCarty, and Howard Hatch.

Winners in the ladies' bridge tournament, directed by Mrs. Henry Gaede, were as follows: high score, Mrs. J. A. Parker; second, Mrs. Thomas Larson; third, Mrs. Henry Curlee; consolation, Mrs. Gene Kiefer.

A large share of the credit for the success of the 1941 summer outing can be attributed to the efficient manner in which the details were arranged and handled by the officers and committeemen in charge.

Officers of the Piedmont Section are: L. M. Boyd, chairman; T. W. Church, vice-chairman; R. D. Howerton, treasurer; and D. Stewart Quern, secretary.

S. C. Mill Men Discuss Carding, Spinning, Weaving

(*Continued from Page 22*)

Frank D. Lockman: I might add one more thing. If you are picking your loom low—that is, after it leaves the center, you are very apt to have broken filling. It hits it harder.

Mr. Burgess: You get more power there?

Mr. Lockman: Yes, sir.

Mr. Burgess: I guess we could name forty things that would cause broken filling. As this gentleman over here said, ballooning will cause it.

Mr. Bishop: I should like to ask a question. Is it better to run the top holder with the Stafford thread cutter, or not?

Mr. Burgess: They may want to know the length of your quill.

Mr. Bishop: It is an 8" bobbin.

Frank D. Lockman: I have no Stafford cutters, but I have 1,680 looms, and we have not used any top holders on them for about eight years.

Mr. I.: We get the idea sometimes that the top holder is a necessary nuisance. Perhaps it is. We can get by without the top holder, but I think the lesser of two evils is with the top holder.

Mr. Burgess: You think you would have less trouble with the top holder?

Mr. I.: Yes, sir.

Mr. Bishop: With the Stafford cutter?

Mr. Burgess: What is your opinion, Mr. Mace?

Mr. Mace: I find we get along much better without it with the Stafford cutter, but I would not be without it without the Stafford cutter.

Mr. Burgess: What kind of transfer do you have?

Mr. Mace: Fork.

Mr. Burgess: It comes out of the end of the bobbin?

Mr. Mace: Yes, sir.

Mr. Burgess: I should like to ask a question. Do you or do you not get as good results with the short hammer?

Mr. Mace: I like the fork better.

Mr. Burgess: I have tried both. My experience with the fork is that the fork is wider than the bobbin and, if you are not very careful, this long fork will touch the sides of the shuttle sometimes and beat it up. Also, unless the spinners make good, firm filling, that fork on the end of the bobbin will loosen that filling and cause it to slough off.

Mr. Mace: Don't you think you have more hanging bobbins with a fork?

Mr. Burgess: Do you have any trouble with hanging bobbins, Mr. Lockman?

Frank D. Lockman: Yes, sir, we have some, but we always have had them. I have been in the weave room thirty years, and we have always had some. We are using the short hammer.

Mr. Burgess: We have taken off the long hammer, because it was striking the filling.

Mr. Bishop: I know some good mills running top holders, and some good ones not running them. I was figuring on putting them on and wondered if it would be a paying proposition.

Frank D. Lockman: I don't know.

I am asking this for information. What effect does the Stafford thread cutter have in relation to the top holder?

Mr. Burgess: I don't know whether I can answer that or not. The Stafford cutter has blades which enter the slot in the shuttle.

Mr. Lockman: And catch the filling?

Mr. Burgess: Yes, sir.

Mr. Lockman: How does that help to do the work that the top holder does?

Mr. Burgess: Well, the top holder comes down under the bobbin and holds it as it goes in, or it is supposed to do that. I really do not know whether that cutter comes too close to the top holder or not.

Mr. Bishop: What is the purpose of the top holder—to get the bobbin in the shuttle?

Mr. Burgess: Yes, it seems to be. But I am like you; I have seen good mills with top holders and some good ones without them. I saw one new mill recently that left the top holders off.

Frank D. Lockman: I always thought the top holder broke a lot of filling. That is one reason we got rid of them.

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WANTED—Position as master mechanic; 15 years' experience as same. Thoroughly familiar with steam or electric drive; machine shop work, repairing, upkeep, installation of mill machinery and power plant equipment. Address "M. M.," c/o Textile Bulletin.

WANTED—Position as Jacquard Weaving Overseer, Taps, drapes, spreads, etc. Any make of looms or head. First-class loom fixer; 10 years' experience as overseer. Address "Jacquard Weaving," care Textile Bulletin.

Nation's Rayon Capacity Now 37,200,000 Pounds Monthly

Of all the domestically used textile fibers, rayon yarn has the tightest supply situation at the present time, states the current issue of the *Rayon Organon*, published by the Textile Economics Bureau, Inc. This situation prevails despite the fact that the industry is constantly stepping up its operating capacity. The supply situatin, however, has reached the point where it has become necessary for producers to allocate shipments.

The operating capacity of the industry at the present time, according to the *Organon*, is 37,200,000 pounds monthly and should reach a total of 38,000,000 monthly before the end of 1941. This is a substantial increase as compared with a capacity of 32,500,000 pounds reported for the second quarter of 1940 and with 25,000,000 pounds reported for the second quarter of 1939.

Despite the increased production, demand for rayon continues on such a high level that stocks in the hands of producers continue at an extremely low level. Such stocks totaled 4,300,000 pounds on June 30th, equal to a half a week's supply at the current rate of shipments, compared with 5,800,000 pounds held as of May 30th, 12,800,000 pounds on June 30, 1940, and with 33,300,000 pounds held on June 30, 1939.

Shipment sof rayon yarn aggregated 220,000,000 pounds during the first six months of 1941, a new all-time record which compares with shipments of 186,000,000 reported for the first half of 1940 and with 162,000,000 in the first half of 1939. These increases have been due somewhat to inventory depletion, but are principally due to production increases.

Shipments of rayon yarn for June totaled 38,600,000 pounds as compared with 40,200,000 pounds in May and 31,400,000 pounds in June, 1940.

Index to Advertisers

Where a — appears opposite a name it indicates that the advertisement does not appear in this issue.

Classified Department

Says Sears in 1940 Used 247,000 Bales Cotton

Buffalo.—Sears, Roebuck & Co., participating in National Cotton Week with special offerings in widely scattered departments of its store, said that during 1940 Sears consumed 123 million pounds, or 247,000 bales of cotton.

Cotton Goods Markets

New York.—The issuance of the OPACS order setting a ceiling on certain gray goods has practically stopped trading on the market here. The opinion that the prices set are not acceptable to the trade is almost unanimous through the industry. The following statement by Leavelle McCampbell, of McCampbell & Co., gives an indication of the feeling of the market.

"Worth Street leaders are quite in sympathy with the fixing of fair and reasonable ceilings on staple cotton piece goods. However, they do not regard the ceilings recently promulgated by Mr. Henderson as fair and reasonable.

"They regard any ceiling not related to the price of cotton by a simple formula as unfair and unreasonable; cotton in cloth has advanced approximately 5 cents per pound within the last 90 days.

"They regard any price ceiling not related to further arbitrary change in wages by simple formula as unfair and unreasonable; Mr. Henderson's schedule was promulgated a week ago Saturday and on Monday following the cotton mill wage minimum was advanced by Government order 15 per cent.

"They regard the fixing of prices by plucking them out of a hat instead of making them the subject of public hearing, as was done in fixing wage minima, as unfair and unreasonable. Fixing print cloths and tobacco cloths at the same level is a striking illustration of the grotesque results that spring from such procedure.

"They regard tampering with the price of existing contracts by the so-called retroactive feature as totally unnecessary in light of the fact that mills have delivered and are now delivering millions of yards at prices far below these ceilings, and beyond that as a direct violation of the American Constitution which distinctly states 'No State shall pass any law which impairs the obligations of contracts.'"

To indicate how unanimous the industry views along these lines are, Mr. McCampbell said: "I know of no single mill which has offered to sell one yard of goods at the ceiling prices. I know of no single mill which has revised the price to ceiling on any yard of goods it has shipped."

It is likely, in the face of such universal condemnation by an industry, that Mr. Henderson will be practically forced to take some action to relieve the hardships imposed on the mills by his order.

Cotton Yarn Markets

Philadelphia.—The combed yarn section of the sales yarn industry has filed a brief at Washington setting forth their reasons as to why the present combed yarn ceiling prices should be raised. They list the advance in staple cotton and wages and also several alleged inequalities in prices of finer numbers.

In the meantime, combed spinners are selling little new yarn, feeling it advisable to see if any action is taken on this request. There are also indications in the combed end of the market that after such an adjustment is made combed spinners will refuse to sell much further ahead than 60 days. They believe that under-ceiling conditions they have little to gain by selling far ahead.

Combed spinners have been selling little new yarn recently and yet they have been shipping out at a record pace on old contracts. This means their backlogs have been reduced sharply, but this is considered a favorable development by many spinners who point out they still have about four months business on hand so that the interruption of trading merely brings orders down to a more normal basis. In this connection combed spinners declare once they start to operate again there will be no trouble in selling all the production offered as far ahead as they care to go.

Carded yarn prices are gradually going up and several counts are now near levels set in the combed ceiling for corresponding numbers but there is widespread opinion in the carded spinning field that asking prices should not go much higher unless the combed level should be raised by Price Administrator Leon Henderson.

There is a belief that if conditions make it impossible for carder spinners to hold prices down there will be no other course but for the Government to set a ceiling in carded yarn too.

There is nothing to indicate spinners will be able to keep carded yarns down in view of the exceptionally active demand and for deliveries further ahead.

Many carded yarn producers are not opening their books as yet for last quarter shipments but those that have take little time before this production is snapped up. Buyers of both carded knitting and weaving numbers are willing to take all the yarn offered. It is not a question of selling but of allotting production by spinners at present.

This is reflected in reports from commission firms who say they could sell much more yarn than at present but very few of their sources of supply have open production.

S. C. Mill Men Discuss Carding, Spinning, Weaving

(*Continued from Page 37*)

Mr. J.: My experience is that the Stafford thread cutter has no direct action with the top holder. The loom can be operated with it or without it. With the top holder you should use a short fork, because if you have a long fork it comes out in the place where the top holder should be and crowds the filling in the shuttle.

Mr. Burgess: Is there anything further? Does anyone want to bring up any other subject?

Mr. Stutts: I should like to ask a question. Do you who are running rayon use a plain selvage on it or a tape selvage?

Mr. K.: That depends.

Mr. Stutts: A lot of mills are running the tape selvage, but some run rayon without it. We have tried it both with and without and cannot get our work to do right without the tape selvage. I should like to hear from some of the men as to their experience on that.

Mr. Burgess: Some of you other weavers tell us what has been your experience with the selvage on rayon. Do you run plain selvage or tape? That is on challis?

Mr. Stutts: Yes, sir. Do you ever run rayon challis without the tape?

Mr. Bishop: Yes, sir.

Mr. Stutts: Most mills are using the tape selvage.

Mr. Burgess: Mr. Crow, what has been your experience on that?

Mr. Crow: We are not running challis cloth at the present time. Three or four years ago we ran some. We always ran our challis with the plain selvage.

Mr. Stutts: Did you have any trouble wtih breaks, not in the cloth but in the edge of the selvage?

Mr. Crow: As I recall, we did not have any excessive amount.

Mr. Stutts: We have had some trouble with that; it breaks not in the cloth but right in the edge of the selvage.

Frank D. Lockman: Is that what you call pin-hole selvage, or soft selvage, or what?

Mr. Stutts: No, the filling seems to catch right in the edge of the selvage and break.

Mr. Lockman: I would suggest that the timing of the harness has something to do with that. The reed closes up too soon, and that causes the shuttle to make a hole in the last place, which is on the edge of the cloth.

Mr. Burgess: I should like to ask you gentlemen one question. Which is the correct place to have your ring rail, when bearing the ring rail down to doff the frame? Should it be at the top of the bobbin or at the middle of the bobbin or on the down stroke? Which is the correct position, or does it make any difference?

A Member: Ask that over.

Mr. Burgess: Say you are running filling. What is the correct position in which to have the ring rail when you

doff? You see, it makes a 2" stroke or a 2¼". Should you have it at the top of the bobbin or at the middle or on the down stroke?

John S. Lockman: I should say on the down stroke.

Mr. K.: I should say on the up stroke.

Mr. Burgess: That is when the rail is at the top?

Mr. K.: At the bottom. When it changes at the bottom and starts up.

John S. Lockman: I think that would depend on the traverse.

Chairman Morton: I think the gentleman is right there in giving room to shake the traverse. But so many of us now have the bunch builder that we do not shake that traverse any more. I have always been taught that the best time to lower the traverse is when you make the change at the top. When you bear down you have plenty of time to shake it, if you want to shake it.

Mr. Burgess: That sounds good to me. I had the idea that the bobbin would thread up better with the end up at the quill than with the end two and a half inches from the quill.

John S. Lockman: I never saw any except at the top.

Question: Do you have bunch builders on your frame?

Mr. Lockman: No, sir.

Mr. L.: Do you unwind your traverse to shake it and then hold it down and then rewind the traverse to get the bunch on there?

Chairman Morton: No, sir. My doffers just shake the traverse like that (illustrating) and then just start it up.

Mr. L.: In other words, you do not put very much kink in the ends?

Mr. Morton: No, sir.

Mr. Burgess: It seems there is a difference of opinion as to where you bear the ring rail down. Some do it at the top of the stroke and some do not. I am just wondering which is the best place from the weaver's standpoint. Some spinners say you should start from the bottom of the stroke, which is contrary to my idea; others say you should start from the top. That is something we are going to experiment on a little bit and see if you destroy the length of your bobbin by shaking it.

Are there any other questions anyone wants to bring up?

Mr. Royal: This morning I had a letter from the University of Texas which I should like to bring to your attention. The writer had been reading about one of our meetings in which the question of dyeing Texas cotton came up. He says:

"Among other things mentioned, the question of the relative merits of dyeing Texas (southwestern) cottons and southeastern cottons came up. The inference was that Texas cottons are more difficult to dye. This is an interesting question, and we are very much interested in determining as nearly as possible the exact nature of the problems involved in dyeing Texas cotton as contrasted to the ease in dyeing other cottons."

I wonder if anyone here has had any trouble with Texas cotton that you know about, either in spinning or dyeing or anything else. This gentleman is very anxious

that Texas cotton be considered as good as any other cotton. Has anyone here had any experience, good or bad, with Texas cotton, or do any of you know whether you have actually run any Texas cotton?

Mr. M.: Yes, sir.

Mr. Royal: Did you have any trouble with it at all?

Mr. M.: No, sir.

Mr. Royal: Did you have any trouble with the dyeing or spinning?

Mr. M.: No, sir.

Mr. Royal: I am going to write him and tell him that.

Mr. M.: I could not tell any difference from other cotton. It has all been disproved now that the section from which the cotton comes has anything to do with it. It depends upon the breed of cotton. It is erroneous to classify one particular batch of cotton because it came out of Texas. It is like trying to classify one stone that came out of the ocean.

Mr. Royal: What about irrigated cotton?

Mr. M.: That is a different question. But there is practically no irrigated cotton in Texas.

Mr. Royal: No, sir; most of it comes out of Arizona and New Mexico.

Chairman: We are glad to have Mr. David Clark, the editor of the Textile Bulletin, with us. Please stand, Mr. Clark. (Applause.)

Mr. Robert Philip, of *Cotton*, is also here. Will you stand, Mr. Philip? It is some time since you have been with us. (Applause.)

Mr. Frank D. Lockman, the President of the Southern Textile Association, is here. Stand up, Mr. Lockman. (Applause.)

Mr. Crow, we want to thank the Drayton mills for the use of this building this morning.

Mr. Crow: We are very glad to have you here and hope you will come again.

Chairman Morton: If there is nothing further, the meeting is now adjourned.

(The meeting thereupon adjourned at 12:10 o'clock P. M.)

Combination Yarn Defects

(*Continued from Page 14*)

ation. The answer is the need for production. I say production—or production cost—because in the case of low turn 150/150 combination it actually is cheaper to throw it in one operation than in two, although it is generally agreed that when the ply twist exceeds about ten turns per inch, that the two process operation is cheaper. Doubler-twisters are the bottle-neck in most combination throwing plants in spite of all the old silk double-twisters that can be had. These silk machines are ill-suited to the relatively heavy rayon combinations. They are not capable of handling the package sizes and of producing the accurate twists that are necessary. Excessive knotting alone, due to the package size, condemns these machines especially at this time when knots them-

selves are more frequently being considered defects and when it is realized that knots cause many skin-backs due to the harsh crepe thread biting through the acetate. Mechanical knotters kept in good condition can help the throwster prevent this defect of strip-back at the knot, but nothing I know of will take the place of having operators test each knot tied and note particularly that both ends lie smooth on each side of the knot. Even so, a tug later on may cause the acetate to part and strip. A sure cure is knotless yarn.

Strip-backs result from numerous causes, it seems, and much needs to be done to prevent them. They can be caused by waste, slubs, or even knots in the single ends. In 150/150 combinations, stripping of the crepe while the acetate holds is often indicative of damaged or weak crepe, but sometimes it is just bad plying. In this same combination, stripping of the acetate is normally more common since the 150 denier crepe has a greater elongation before it reaches the breaking point than does the acetate. This is also true of 100/100 and 75/75 combinations. On these yarns the throwster is faced with the dilemma of loopy yarn that will break perfectly or smooth yarn that will have a slight tendency toward acetate strip-backs. Acceptable yarn is being made, but tolerances on 150/150, 100/100, and 75/75 are much narrower than on combinations made with 100 denier crepe combined with 150 denier acetate or combinations made with 75 denier crepe and 100 denier acetate. The last two combinations named have their breaking points closer together in relation to elongation. This fact, when considered with what has already been said about the contraction of the yarns when combined, largely explains why combinations made from unlike deniers (100 crepe with 150 acetate and 75 crepe with 100 acetate) generally contain fewer defects than do combinations made from so-called like deniers.

Please bear in mind that all references made so far pertain to acetate, crepe, and ply twists all being in the same direction for each combination. When one of the twist directions is changed theproblem of preventing defects becomes very difficult and in many cases almost impossible to solve on some of the equipment being used. With the exception of using opposite twist acetate in the combination, most changes in twist direction are made to produce particular effects that might otherwise be called defects. It reminds one of the old question of "What is a weed?" Personally I would call such yarns novelties, not combinations.

It can be inferred from what already has been said that by using acetate that contains an opposite twist from the crepe and ply, yarn defects in the form of loops are sure to appear unless correction is made in feeding the yarn, which usually is done with tension.

In such cases the acetate will tend to form more of a sheath around the crepe than would happen with acetate originally having the same twist direction. This sometimes is desirable for a particular effect but the broken filaments which generally accompany it rarely are. Such combinations are prone to have many more broken filaments than the conventional, both because the acetate is more exposed and because it must pass a zero point where individual filaments are unprotected by any twist in the acetate. Centrifugal forces alone during twisting in such yarn is sure to bring out any filaments that pre-

viously were broken and to add to them. The traveler, or flyer wire—depending upon the point where the yarn is unprotected—also adds to the broken filaments unless speeds and tensions are kept down. Low humidity will aggravate any broken filament condition and is often blamed for causing it. Bobbins not centered to ring on doubler-twisters are another source of this defect. Fortunately corrections here are simple.

Opposite twist acetate and excessive tensions are by no means the only causes of broken filaments, which the throwster must do his share to prevent. I say "do his share," because this is one common defect that can be, and is caused, everywhere. It happens generally either by the yarn striking something it should not, or by its being run through or over a damaging surface. Finding the cause practically always shows the cure.

Wrong or worn travelers account for many cases of broken filaments. This trouble reoccurs since the fit of the traveler needs changing as the ring wears. The selection of the proper traveler for combination yarns is a study in itself. The proper design prevents broken filaments from this cause except when there are travelers threaded backwards, which makes broken filament yarn that could be used for Celafil or abraded yarn if only it were uniform. It might be said here, that in running abraded combinations, defects and their prevention follow that of similar regular combinations except that machines must be cleaned constantly to keep out twisted-in waste and slubs. When yarn is abraded while being thrown into combination, there is also the serious problem of keeping the abrasion uniform to prevent, principally, filling bands.

While discussing the less usual combinations mention should be made of 4-ply yarns which will lead up to the main point I wish to make to you this evening. The usual 4-ply combination is made by joining two 100/75 yarns: that is, 100 denier acetate and 75 denier crepe. One 100/75 thread is 10 turns "S" twist and the other is 10 turns "Z." Ply usually is 5 turns "S." This means that the "Z" twist thread is going to have 5 turns backed out of it in the final final plying operation. It will elongate greatly while the "S" twist 100/75 will contract. As would be expected loops and strip-backs are the principal troubles. There is such a serious problem in holding back the feeding of the "Z" twist end in this yarn that, to my knowledge, the yarn has been run only passably well although the problem is clear. The trouble is that there is no machine built fully adapted to running this combination. What is needed is a machine with a double line of feed rolls plus a stop motion. In fact, would not such a machine be ideal for all combinations mentioned? It seems that the ultimate solution of combination throwsters' main problem lies in the development and use of such a machine. Eventually, if combinations continue in favor, such machines may become numerous enough so that no low twist combination yarns need be run in two operations, and sufficiently available so that a greater number of turns can be put in the first operation in two-process yarns than is now generally possible. Thus the character of the completed yarn would be better shaped than is possible only when the very minimum of turns are inserted in the first process.

I have seen an experimental machine, and have heard of a second, such as I refer to. Both had two lines of

feed rolls and stop motions. In my opinion the feed wheels on one of these were no tsufficiently positive, but the stop motion was excellent and package size adequate. To my knowledge there has been no call for either machine largely because of the cost and the serious question of how long combination fabrics would continue in favor. I understand that development of both machines has been suspended during the present defense emergency. If combination yarns show definite evidences of continuing, if there are profits in them, and if the pressure for more nearly perfect combinations continues or increases, there is no question but that machines specifically developed for producing them will be built. It appears that one of the big obstacles confronting rayon throwing has been, and is, slowness or reluctance of throwsters to demand and help develop throwing machinery particularly suited to rayon yarns. There have been shining examples to the contrary and their luster appears brighter by contrast to the many places where rayon has been fitted to some other textile's equipment, rather than have equipment and methods developed specifically for rayon. We all know that when the present abnormal general condition is over, it will be the plants that are best equipped to handle rayon that will continue to do so, and that marginal plants either will have to shut down or operate at a loss. It is none too early now to prepare for that time, but in regard to rayon combination yarns there is still the question of what assurance is there that they will continue. What will take their place?

Returning more specifically to our topic of combination yarn defects, a number of defects have probably been conspicuous by their absence, except for having been mentioned earlier. For the most part they are not peculiar to combination fabrics; for instance, slack and hard twist, yarn burnt on cork-rolls, foreign waste, cut or weak yarn, off denier, and mixtures. Since they are not peculiar to combination fabrics and since time is limited they have been omitted.

Text of Ceiling Order On Grey Goods

(Continued from Page 16)

make a sworn statement that during the preceding calendar month all such sales, either for immediate or future delivery, and deliveries, other than those described in Section 1316.2 (a) (2), were made at prices in conformity with this schedule or with an exception or modification thereof.

"1316.5 Enforcement. In the event of refusal or failure to abide by the price limitations, report requirements, and other provisions contained in this schedule, or in the event of any evasion or attempt to evade the price limitations or other provisions contained in this schedule, the Office of Price Administration and Civilian Supply will make every effort to assure (i) that the Congress and the public are fully informed of any failure to abide by the provisions of this schedule, and (ii) that the powers of the Government are fully exerted in order to protect the public interest and the interests of those persons who conform with this schedule in the observance of the maximum prices herein set forth. Persons who have evidence of the demand or receipt of prices above the limitations set forth, or any evasion of or effort to evade such prices, or of speculation, or of the hoarding or accumulation of

unnecessary inventories thereof, are urged to communicate with the Office of Price Administration and Civilian Supply.*

"1316.6 Modification of the Price Schedule. Persons complaining of hardship or inequity in the operation of this schedule may apply to the Office of Price Administration and Civilian Supply for approval of any modification thereof or exception thereto.*

"1316.7 Schedule of Maximum Prices:

Maximum Prices for Cotton Grey Goods

Type of Cloth	Price per lb., f.o.b. seller's point of Shipment
Standard print cloth, 40" and narrower	$ .39
Carded broadcloth, 40" and narrower, 100 slep and below	.39
Combed broadcloth, 40" and narrower, 136 sley and below	.54
Sheeting, 40" and narrower	
A. Yarn numbers up to 15s, inclusive	.30
B. Yarn numbers 16s to 21s, inclusive	.32
C. Yarn numbers above 21s	.335
Part waste osnaburgs, 40" and narrower	.25
Tobacco cloth, 40" and narrower	.39

"1316.8 Effective Date. This schedule shall take effect June 28, 1941.

"Issued this 27th day of June, 1941.

"/s/ Leon Henderson
"Leon Henderson,
"Administrator."

The Spinning Quality of Texas Cotton

(*Continued from Page 10*)

is so, as on an average the cottons ranked second, second, and first in this respect. The Lubbock cottons were not as high in fiber strength, and for the first two years the yarns ranked a little below the average of the eight stations, tested for the belt as a whole.

Eight Cotton Varieties Lead

Referring again to the one-variety cotton communities in this State we note that in 1939, most of the cotton planted in the 422 communities was of the following varieties, which are listed in the order of the number of communities adopting them: Acala, Mebane, D. & P. L., Lone Star, Paymaster, Rowden, Delfos and Stoneville. It should be understood that these are the parent varieties, and that for many of them there are numerous strains, some of which for commercial reasons are designated by other names or identifying means. Because of the limitations in the capacity of the laboratory previously pointed out, and of the range of tests which the laboratory is called upon to do, it has not been possible to test all important strains of these varieties. The following brief summaries will show, however, the more important spinning and fiber test features for many of the cottons adopted by the one-variety communities.

Acala. Staple length, 31/32 to 1-1/32 inches. This variety illustrates well the wide range in spinning and fiber quality that different strains of a given variety can

possess. And it may be said, in this connection, that it is doubtful whether this fact has been given due consideration in the selection of Acala planting seed in Texas. We cannot, of course, do anything about the water that already has gone over the dam but we can do something about that which goes over in the future, provided we have adequate facts and are willing to use them without bias or prejudice.

To illustrate, in practically all variety tests made to date in our laboratories, the Rogers Acala generally has stood either at or near the top of the list. With regard to the Acala samples, the Rogers Acala has stood considerably above the other Acala samples. Low waste percentages and high yarn and cord strengths have been found consistently. Possibly its only shortcoming is its slight tendency to produce rough yarns. Rogers Acala is somewhat finer-fibered than most upland varieties, and possesses very high fiber strength.

In contrast to Rogers Acala is the so-called Shafter or California strain of this cotton. In practically all tests of this cotton as produced under rainfall conditions, the lint has been found to be wasty, and the yarns rough and neppy, and of about average strength. In one case, where the cotton was grown in a comparative test at Victoria, it was found to possess satisfactory quality, but in practically all others its quality has been found to range from slightly below average to extremely poor.

In the Victoria test, Texacala, and the Lentz and Hasselfield strains of Acala were also found to possess high spinning value. In fact, they all made stronger yarn than did the Shafter Acala even though they were classed 1/16-inch shorter.

Mebane. Staple length, 29/32 to 1-1/32 inches. During the past year, seven strains of Mebane have been tested, as follows: Mebane 140, A. D. Mebane Estate, Bryant Mebane, Buckellew Mebane, Cliett, Watson, and Qualla. There is, of course, some variation among these strains, and within a particular strain grown at different points. Nevertheless, there are certain characteristics that seem to be more or less common to all of the strains tested. Although one or two samples produced strong yarns, as, for example, Mebane 140, the yarns of which were 10 per cent stronger than the average for its length, in general these strains are about average in this respect. Most of the cottons of this variety were somewhat below average in fiber strength, and were medium- to coarse-fibered. All were found to spin well, yielding less than average quantities of manufacturing waste, and producing yarns of good appearance. In general, it may be said that these strains of Mebane would appeal to manufacturers of goods in which normal spinning quality is desired, but in which unusually high tensile strength is not important.

D. & P. L. (Deltapine 11, 11A, and 12). Staple length varies from 1 to 1-1/16 inches. Practically all the samples of this variety tested in the Department's laboratories have been found to be medium-fine in fiber weight, of average maturity, and of average to somewhat lower than average strength. Its spinning quality is found to be desirable from the standpoint of wastiness, yarn appearance, and general manufacturing performance, and the tests indicate that it should be a satisfactory cotton for many yarns and fabrics where outstandingly high strength is not an essential factor. Tests to date have shown only very small differences among Deltapine 11, 11A, and 12.

Lone Star. Staple length, 1-inch and 1-1/32 inches. Several different strains of this cotton have been tested over a period of years at the Service's laboratories. Its spinning quality is usually somewhat better than average, and it appears to show up well under both rainfall and irrigated conditions. The quality of the lint is somewhat simlar to Rogers Acala, except that it is easier and not quite so strong.

Rowden. Staple length generally is about 15/16 or 31/32 inches. Strains recently tested have included Rowden 2088, Sunshine, Roldo Rowden, Malone Rowden, and Miller. This cotton is outstanding for its coarse, highly mature, and strong fibers. This combination of properties makes a hard-bodied cotton that is very desirable for many types of manufactured products. The cotton yields a low to average percentage of manufacturing waste and produces yarns of good strength and smooth,

even appearance. One or two of the strains included in the 1940 tests were somewhat disappointing in yarn strength and manufacturing waste. On the other hand, Rowden 2088 has consistently given good results to date.

Delfos. There are a large number of strains of this variety, differing considerably in staple length, and it has not been possible for the spinning laboratory to test many of them. Generally speaking, this cotton possesses about average fiber properties except that its immaturity count is somewhat higher than that of most others. Grade statistics show that the lint is about one grade lower than that of many other varieties selected by one-variety communities, and in the spinning tests Delfos has been found to be rather rough and neppy.

Stoneville. Staple length, 1-inch to 1-1/16 inches. This is another cotton that has shown up well in our laboratory tests. Its quality has been found to be consistently good when grown under a wide variety of soil and climatic conditions. It is characterized by medium fineness, and average-to-strong fiber strength. Its only shortcoming appears to be a tendency toward rough yarns, but it is not as objectionable in this respect as a number of other well-known varieties of about the same staple length.

Paymaster. No spinning tests have been made in our laboratories on this variety of cotton.

We have already completed this year a series of spinning and fiber tests of 49 different samples of cotton furnished through the co-operative efforts of the Texas Agricultural Experiment Station and the Bureau of Plant Industry. The cottons were grown at Greenville, Chillicothe, Temple, College Station, and Victoria, and include many well-known varieties as well as special new strains which have not yet been produced commercially. At the present time a report of these tests is being prepared, and it is hoped that the summarized findings can be made available in the near future to both individuals and groups of planters, as well as to cotton breeders and agronomists. Copies of the results have already been transmitted to the breeders of the co-operating Texas Agricultural Experiment Station and the specialists of the co-operating Bureau of Plant Industry.

With the loss of the major foreign markets for Texas cotton, which we all hope is only temporary, it is now more important than ever for Texas farmers to produce the qualities of cotton desired by domestic spinners. We have already seen indications this year that Southeastern spinners are evidencing a greater interest in Texas cotton. The demand for it will be determined, of course, by price and quality. Regardless of what they can do about price, the cotton farmers of Texas certainly can control quality to a considerable extent by planting the varieties that are known to be the best.

Data on yield, staple length, and lint turnout on these cottons are available at the State Experiment Station. By considering this information carefully, in conjunction with the spinning and fiber quality data being obtained in the co-operative laboratories, it is possible for farmers in the areas where the cottons in these tests were grown to select a variety that will insure a high cash value for the crop, and at the same time produce a quality that will appeal to the spinner. In this latter connection, we are finding that manufacturers are paying more

and more attention to the varieties of cotton that will meet their requirements, and to sources from which they may obtain cotton of those varieties. They are studying the findings of these spinning tests with just as much interest as the producers. They are also studying lists published by the Department of Agriculture showing the name of the variety planted by each one-variety community. All signs now point to a new era in cotton marketing as a result of this work, in which the producer will grow what the mill wants, and the spinner will be able to locate ample supplies of just the quality of cotton he needs.

To arrive at this goal, however, is going to mean, first of all, a substantial reduction in the number of varieties of cotton that are grown in this country. It has been estimated that instead of the literally hundreds of so-called varieties of cotton now being grown in the United States, the requirements of domestic and foreign spinners could well be met by decreasing this number to perhaps not more than 12 or 15. This certainly does not mean that fewer breeders would be required. Instead it means that their improvement efforts, talent, and money would be more concentrated and less thinly spread out, and that as a consequence, they would be more productive and beneficial to all concerned with American cotton. Whether or when the number of varieties will ever be reduced to such an extent is problematical. But our increasing fund of knowledge regarding varieties and the increasing interest in the subject on the part of the manufacturer, together with the converging of both producers' and spinners' interests in the Cotton Improvement program, are bound to result in the growing of fewer varieties and in the production of better cotton.

Much remains to be done, but the co-operative work being conducted by the Southern State agricultural experiment stations and colleges and by the various agencies of the United States Department of Agriculture, is beginning to yield results of practical and far-reaching value.

Promoting the Domestic Consumption Of Cotton

(*Continued on Page 47*)

of flame-proof, vermin-resistant cotton insulation, and a rapidly increasing use of fabric-covered panels for both interior and exterior walls of residential and commercial buildings. The use of cotton fabric to line the walls of irrigation ditches and canals, and to prevent the erosion of loose soil from embankments and terraces has been satisfactorily developed.

But these are only nibblings on the fringe of the great opportunities which are in this field. Men with technical training and imagination should be assigned to study the materials, the equipment and the processing of all the industries in America for the purposes of ferreting out all possible uses for which cotton might be adapted. Once these opportunities have been discovered and listed, they become the raw material of the laboratory whose function would be to effect the adaptation necessary for cotton to meet the requirements of the potential use.

Important Art of Selling

But whatever the achievements of scientific research, our ambitions for cotton can never be realized without great progress in the methods and arts of selling. The cotton-textile industry is extremely complicated, and consists of many units which are diverse in function. Most cotton goods reach the final consumer through a very circuitous route and after passing through the hands of a number of independent groups. Consequently, the control of total sales effort is not centralized. The sales effort of the average unit in the trade is usually confined to a very small area. In many instances there is present no realization of sales responsibility and no interest in the development of a broad market for cotton products in general.

This is, of course, due primarily to the character of the industry's organization and the remedy can be found not by forcing a change in the nature and habits of existing units but by making available to them external aids devised and in large part administered by an agency which is interested in the industry as a whole but not itself engaged in the selling of products. An understanding of these external aids can best be had by visualizing clearly the particular functions to be served.

Probably the most important of these functions is to bring closer together the suppliers and the distributors. Suppliers exist by the thousands. Some of them are cotton manufacturing enterprises; some of them are converters; some of them are garment and household article manufacturers; many of them are secondary processors of all varieties. Although there is great variation in the scope of their activities, the majority have a comparatively short market reach. All of us no doubt have noted the very small number of cotton goods manufacturers who engage in national advertising.

The buyers of cotton goods, in their turn, are extremely numerous with each individual able to contact only a very small portion of the market and extremely limited in his opportunity to keep abreast of all market information and market sources. Consequently, there is a great service to be performed in behalf of the suppliers and distributors equally in making available to them more adequate information.

This involves a broad and continuing market coverage by skilled and impartial reporters. They compile two classes of information: the first of which is concerned with the complete story of commodity sources and prices for the use of all buyers, irrespective of special interests. The second class of information is highly selective in character and seeks to reveal the things which are new or distinctive. In this latter category is assembled the news which is of primary interest to the fashion world. There must be not only wisdom and experience in the selection of such information; there must also be great judgment in its dissemination. Such news is distributed in many forms through advertising, bulletins, press releases, circular letters, motion pictures, fashion editorials, and exhibits.

Such informational service contributes directly to total sales, not only because of the greater ease of purchasing which results, but also because of the greater opportunity which it provides for the superior market offerings—whether in terms of fashion or quality or of price. It also greatly strengthens the competitive position of cotton goods as a whole.

A second major function to be accomplished in our program is to make closer the mutual understanding of retailer and consumer. If we can be of service to retailers in connection with the goods they buy, we can also be of benefit to them in the resale of those same goods. This can be done by keeping them informed as to the varying shades of consumer interest. We can help them with suggestions and methods having to do with their advertising, their displays and their technique of salesmanship. We can advise them on the particular points of consumer appeal which lie in the various commodities.

The natural corollary of such selling aids to the retailer is the direct education of the consumers themselves. This cannot be done didactically or argumentatively. It

must be accomplished through simple, attractive, dependable and straightforward information.

All the devices previously mentioned—the press, magazines, radio, motion picture and commodity exhibits—can and must be used for maximum results. The consumer's interest cannot be aroused and his education cannot be broadened by recourse to sentiment or patriotism or duty or value claims which have no basis in fact. The major appeal to the consumer does not lie in the cotton itself, but in the cotton product. His education must be on qualities of the product. We expect a woman to buy a cotton dress, a cotton rug, or a cotton drape not because it is cotton, but because the commodity has certain appeal characteristics which can be expressed in terms of price, or design, or color, or durability, or line, or tailoring—or whatever else makes it especially appropriate to her scheme of things.

We might draw on recent military history for language to describe a promotional campaign. It is in the nature of a "pincers" movement. The one is working outward and onward from the sources of supply, concerned with the character of the product and the mechanics of distribution. The other pincer, moving inward, is in the direction of consumer interest toward the commodity. This dual conception of the program is essential if we are to be guided correctly in the use of our promotional devices.

It is foolish to expect a retail store to stock up with a wide range of cotton goods, representing the last word in fashion and in novelties and in variety of use, when the consumers who frequent that store are themselves ignorant of the goods in question, or insensible to the enjoyments which they would give. On the other hand, it is equally foolish to carry on an extensive campaign of consumer education for the purpose of creating an active desire for certain products when the local sources of supply are unable to satisfy the desires. One of the most familiar types of letter received by the Cotton-Textile Institute is the letter of complaint that certain advertised or publicized cotton goods cannot be found in the stores. We have all witnessed the amazing success in the world of consumption of such commodities as coca-cola, cigarettes, automobiles and radios. In each instance that amazing success is achieved by keeping in perfect step the development of supply and the development of consumer interest.

But these are very simple examples compared to the task which confronts us. Cotton goods take many thousands of forms and go into many hundreds of uses. We cannot advertise them or sell them merely as cotton goods, or deal with them as a group. Our technique of promotion, therefore, must concern itself with individual selection. Each item selected is to be chosen not entirely for its own sake, but for its potential influence on other items. A hundred-dollar cotton evening gown modeled by a motion picture actress will receive nation-wide publicity. But the efforts made to obtain such publicity are justified not by the prospect of sales of that particular evening dress but by the resultant volume sales of lower priced dresses which are copies.

This broad view of promotion, its range of activity, and its basic principles has been given you not as a report of what is actually being accomplished but more as a judgment of what should be and what is rapidly coming to be.

Southern Sources of Supply

For Equipment, Parts, Material, Service

Following are the addresses of Southern plants, warehouses, offices, and representatives of manufacturers of textile equipment and supplies who advertise regularly in TEXTILE BULLETIN. We realize that operating executives are frequently in urgent need of information, service, equipment, parts and materials, and believe this guide will prove of real value to our subscribers.

ACME STEEL CO., 2838 Archer Ave., Chicago, Ill. Sou. Office and Warehouse, 603 Stewart Ave., S.W., Atlanta, Ga., F. H. Webb, Dist. Mgr. Sou. Sales Reps.: Frank G. German, 1617 Beverly Drive, Charlotte, N. C., Phone 3-3293; G. R. Easley, 107 Manly St., Greenville, S. C., Phone 1610; William G. Polley, 937 Cherokee Lane, Signal Mountain, Tenn., Phone Chattanooga 8-2635; John C. Brill, 309 Magazine St., New Orleans, La., Phone Magnolia 5859. Warehouses at Atlanta, Ga., Greenville, S. C., New Orleans, La.

AMERICAN CYANAMID & CHEMICAL CORP., 30 Rockefeller Plaza, New York City. Sou. Office and Warehouse, 822 W. Morehead St., Charlotte, N. C., Hugh Puckett, Sou. Sales Mgr. Reps., John D. Hunter, E. H. Driver, Paul F. Haddock, A. W. Foley, Charlotte Office; E. J. Adams, 1404 S. 22nd St., Birmingham, Ala.; Jack B. Button, 610 N. Mendenhall St., Greensboro, N. C.; C. B. Suttle, Jr., 423 Clairmont Ave., Decatur, Ga.; K. E. Youngchild, 10 South St., Mobile, Ala.

AMERICAN MOISTENING CO., Providence, R. I. Sou. Plants, Charlotte, N. C., and Atlanta, Ga.

AMERICAN VISCOSE CO., 350 Fifth Ave., New York City. Sou. Office, Johnston Bldg., Charlotte, N. C. Harry L. Dalton, Mgr.

ARMSTRONG CORK CO., Industrial Div., Textile Products Section, Lancaster, Pa. Sou. Office, 33 Norwood Place, Greenville, S. C. J. V. Ashley, Sou. Dist. Mgr.

ARNOLD, HOFFMAN & CO., Inc., Providence, R. I. Chester L. Eddy, Asst. Sales Mgr., 903-904 Woodside Bldg., Greenville, S. C. Sou. Reps.: W. Chester Cobb, Erwin Laxton and Reid Tull, Charlotte, N. C., office; John H. Graham, Box 904, Greenville, S. C.; Harold T. Buck, 1615 12th St., Columbus, Ga.; John R. Brown, Trussville, Ala.

ASHWORTH BROS., Inc., Charlotte, N. C. Sou. Offices, 44-A Norwood Place, Greenville, S. C.; 215 Central Ave., S.W., Atlanta, Ga.; Texas Rep.: Textile Supply Co., Dallas, Tex.

AUFFMORDT & CO., C. A., 2 Park Ave., New York City. Sou. Rep.: George B. Wilkinson, 613 Johnston Bldg., Charlotte, N. C.

BAHNSON CO., THE, Winston-Salem, N. C.

BANCROFT BELTING CO., Boston, Mass. Warehouse and Sou. Distributor, Carolina Supply Co., Greenville, S. C.

BARBER-COLMAN CO., Rockford, Ill. Sou. Office, 31 W. McBee Ave., Greenville, S. C., J. H. Spencer, Mgr.

BARKLEY MACHINE WORKS, Gastonia, N. C.

BARNES TEXTILE ASSOCIATES, Inc., 10 High St., Boston, Mass. Sou. Office, 1409 Johnston Bldg., Charlotte, N. C.

BAY STATE TEXTILE CO., 220 Hartwell St., Fall River, Mass. N. C. Agt., John Graham Webb, P. O. Box 344, Hillsboro, N. C., Phone 127-B.

BECCO SALES CORP., Buffalo, N. Y. Sou. Reps.: J. D. Quern and D. S. Quern, 1930 Harris Road, Charlotte, N. C.

BORNE, SCRYMSER CO., 17 Battery Place, New York City, and 815 W. Morehead St., Charlotte, N. C. Sou. Mgr., H. L. Siever, P. O. Box 1169, Charlotte, N. C. Sales Reps.: W. B. Uhler, 608 Palmetto St., Spartanburg, S. C.; R. C. Young, 1546 Stanford Place, Charlotte, N. C.; John Ferguson, P. O. Box 592, LaGrange, Ga.

BROWN CO., THE DAVID, Lawrence, Mass. Sou. Reps.: Greenville, S. C., Ralph Gossett and Wm. J. Moore; Griffin, Ga., Belton C. Plowden; Dallas, Tex., Russell A. Singleton Co., Inc.; Gastonia, N. C., Gastonia Mill Supply Co.; Chattanooga, Tenn., James Supply Co.; Spartanburg, S. C., Montgomery & Crawford.

CAROLINA LOOM REED CO., Greensboro, N. C.

CAROLINA RUBBER HOSE CO., Salisbury, N. C.

CAROLINA REFRACTORIES CO., Hartsville, S. C.

CARTER TRAVELER CO., Gastonia, N. C.

CHARLOTTE CHEMICAL LABORATORIES, Inc., Charlotte, N. C.

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